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ROYAL SOCIETY

OF

TASMANIA

PAPERS & PROCEEDINGS
OF THE
ROYAL SOCIETY OF TASMANIA

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THE ROYAL SOCIETY OF TASMANIA

The Royal Society of Tasmania was founded on the 14th October, 1843, by His Excellency Sir John Eardley Eardley Wilmot, Lieutenant Governor of Van Diemen's Land, as "The Botanical and Horticultural Society of Van Diemen's Land." The Botanical Gardens in the Queen's Domain, near Hobart, were shortly afterwards placed under its management, and a grant of £400 a year towards their maintenance was made by the Government. In 1844, His Excellency announced to the Society that Her Majesty the Queen had signified her consent to become its patron; and that its designation should thenceforward be "The Royal Society of Van Diemen's Land for Horticulture, Botany, and the Advancement of Science."

In 1848 the Society established the Tasmanian Museum; and in 1849 it commenced the publication of its "Papers and Proceedings."

In 1854 the Legislative Council of Tasmania by "The Royal Society Act" made provision for vesting the property of the Society in trustees, and for other matters connected with the management of its affairs.

In 1855 the name of the Colony was changed to Tasmania, and the Society then became "The Royal Society of Tasmania for Horticulture, Botany and the Advancement of Science."

In 1860 a piece of ground at the corner of Argyle and Macquarie streets, Hobart, was given by the Crown to the Society as a site for a Museum, and a grant of £3,000 was made for the erection of a building. The Society contributed £1,800 towards the cost, and the new Museum was finished in 1862.

In 1885 the Society gave back to the Crown the Botanical Gardens and the Museum, which, with the collections of the Museum, were vested in a body of trustees, of whom six are chosen from the Society. In consideration of the services it had rendered in the promotion of science, and in the formation and management of the Museum and Gardens, the right was reserved to the Society to have exclusive possession of sufficient and convenient rooms in the Museum, for the safe custody of its Library, and for its meetings, and for all other purposes connected with it.

In 1911 the Parliament of Tasmania, by "The Royal Society Act, 1911," created the Society a body corporate by the name of "The Royal Society of Tasmania," with perpetual succession.

The object of the Society is declared by its Rules to be "the advancement of knowledge."

His Majesty the King is Patron of the Society; and His Excellency the Governor of Tasmania is President.

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THE *DIPTERA-BRACHYCERA* OF TASMANIA.

PART II. FAMILIES *TABANIDÆ & THEREVIDÆ.*

BY ARTHUR WHITE.

(Received 14th July, 1915. Read 9th August, 1915. Issued separately 20th November, 1915.)

Family V. **TABANIDÆ.**

Bristleless flies of a more or less broad and flattened shape, with large squamæ.

Head large and broad, the back flat or concave, and fitting close to the thorax. Antennæ porrect, the third joint always annulated. Proboscis projecting, and frequently considerably elongated. Eyes large, touching in the male, but widely separated in the female. Thorax large and strongly built, without any sign of bristles. Abdomen broad and rather flat, composed of seven obvious segments. Legs fairly stout, middle tibiæ always, and hind tibiæ sometimes, spurred. Wings with the normal venation of the Brachycera; the anal cell always closed, the first and fourth posterior cells either closed or open; the upper branch of the cubital fork frequently possessing a small recurrent veinlet. Squamæ large and somewhat upraised.

The *Tabanidæ* are commonly called in Australia "March Flies," and in other parts of the world "Horse Flies" or "Gad Flies." The females are persistent bloodsuckers, and will attack man and animals indiscriminately. The males are much rarer and less frequently met with than the females; they frequent flowers, whilst one Tasmanian species occurs settled on the ground in hot, sandy places, and the male of another species flies rapidly to and fro in the bright sunshine. The females of several species of Tabanus are common in the bush throughout the summer; the name "March Flies" is, however, somewhat inappropriate when applied to Tasmanian species, as specimens are seldom to be met with after the first few days of that month.

The *Tabanidæ* are divided into two subfamilies, chiefly distinguished by the presence or absence of spurs on the hind tibiæ, those with spurs forming the *Pangoninæ*, those without spurs the *Tabaninæ*. The genera are but few in number and are easily distinguished. These genera, however, contain an immense number of species, and their identification is a matter of considerable difficulty. Fortunately in working out the Tasmanian species, I have had the assistance of Miss G. Ricardo, the chief authority on this family, who has most kindly examined my specimens, and I have also personally examined Walker's types in the British Museum, so the identifications given in the following pages may be taken as trustworthy. Of the 23 species described, 11 occur also on the mainland of Australia, whilst the remaining 12 species appear to be confined to Tasmania.

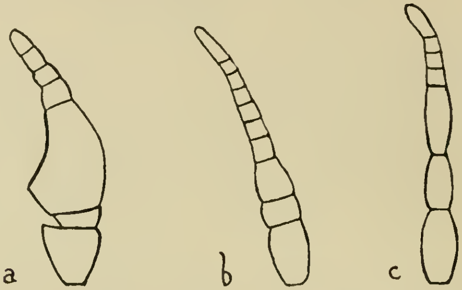

Fig. 12. Antennæ of (a) *Tabanus*, (b) *Pangonia*, (c) *Chrysops*.

Table of the Tasmanian Genera of Tabanidæ.

1. Hind tibiæ without spurs (*Tabaninæ*). 2
Hind tibiæ with spurs (*Pangoninæ*). 3

2. Third antennal joint dorsally humped near its base, with four subsequent annulations.
TABANUS, L.

3. Third antennal joint composed of five segments, the first being much the longest; wings with conspicuous black markings.
CHRYSOPS, Meig.
Third antennal joint composed of eight segments, the first being only slightly the longest. 4

4. Proboscis long, with very small sucker-flaps.
(PANGONIA, sensu lato). 5

5 Wings with first posterior cell open; eyes bare.
CORIZONEURA, Rond.
Wings with first posterior cell open; eyes hairy.
DIATOMINEURA, Rond.
Proboscis with sucker-flaps in the form of a hatchet. 6

6. Anal vein curved, anal cell open, antennæ subulated.
PELECORHYNCHUS, Macq.

16. TABANUS, L. (Fig. 12a).

Face broad. Eyes either bare or pubescent, joined in the male, separated in the female. Proboscis and palpi produced. Antennæ about as long as the head, the first joint short, but longer than the second, the third with the basal segment large and dorsally humped, with four subsequent annulations. Thorax large, quadrate, with rounded angles. Abdomen about as broad as, but hardly longer than, the thorax. Legs simple; middle tibiæ with two apical spurs; front and hind tibiæ without spurs. Wings occasionally, though rarely, spotted; posterior cells usually open; anal cell closed; alulæ and squamæ well developed.

The Tasmanian and Victorian species of *Tabanus* fall into two natural groups. In the first of these, which contains only a few species, the cubital fork of the wings is without a recurrent veinlet, the eyes are sparsely hairy in the female, densely hairy in the male, and the abdomen is unusually broad and flattened; in the second group the cubital fork of the wings possesses a recurrent veinlet, the eyes are densely hairy in both sexes, and the abdomen is not as a rule so flattened. In none of the Tasmanian species is the dorsal hump of the antennæ much developed, indeed in some species the antennæ are almost symmetrical; this character divides them from most of the West Australian, and some, at least, of the North Australian species, in which the antennal hump is greatly developed.

The species of *Tabanus* are difficult to identify, many of them being very nearly allied, and possessing few distinguishing characteristics. The most important characters (in Australian species) are the presence or absence of a small recurrent veinlet to the cubital fork, the shape of the frontal stripe (between the eyes) and the form of the antennæ. Another character that is sometimes of considerable value is the comparative length of the pubescence on the legs, more particularly that of the tibiæ. The colouration is often subject to considerable variation, but the size of a species, fortunately, varies but little. A character that must be used with caution is the presence or absence of a row of central abdominal spots; probably all species possessing the recurrent veinlet have these spots when in perfectly fresh condition, but in some species they are lost very readily. The length of the proboscis, also, is not always a reliable character.

In the following descriptions, "*frontal stripe*" refers to the portion of the front between the eyes in the females; in the males the eyes join, and the frontal stripe is therefore wanting; "*frontal triangle*" refers to the portion of the front bounded above by the eyes and the frontal stripe in the female, or by the eyes alone in the male, and below, in both cases, by the antennæ; the "*callus*" is a shining spot, or portion of the frontal stripe, devoid of tomentum. As the females are the sex usually met with, the males being either extremely rare or else unknown, the description of the female is in every case given first.

Table of the Tasmanian Species of Tabanus.

1. Wings without a recurrent veinlet (or appendix) to the cubital fork. 2
   Wings with a recurrent veinlet to the cubital fork. 4
2. First posterior cell closed; very large species with the wing-veins suffused with brown. LIMBATINERVIS, Macq.
   First posterior cell wide open. 3
3. Thorax and abdomen black. MICRODONTA, Macq.
   Yellowish species, with striped abdomen. SIMILIS, Macq.
4. Wings spotted. GENTILIS, Erich.
   Wing-veins suffused with brown. TASMANIENSIS, Sp. nov.
   Wings hyaline. 5
5. Black and grey species; vertex with long black hairs; tibial pubescence of unequal length. ANTECEDENS, Walk.
   Brownish species; vertex without long black hairs; tibial pubescence uniformly short. EDENTULUS, Macq.
   Very small, olive-black species with tibial pubescence uniformly long. IMPERFECTUS, Walk.
   Small dark brown species; hind femora orange above with black knees. HOBARTIENSIS, Sp. nov.
   Large species with red-brown abdomen; thorax black, striped with grey. CIRCUMDATUS, Walk.
   Sand-coloured species frequenting sandhills on the coast. VETUSTUS, Walk.
   Shining metallic blue-black species. CYANEUS, Wied.

TABANUS MICRODONTA, Macq.

A large black species, distinguished by the absence of a recurrent veinlet to the cubital fork of wings. Antennæ with first two joints brown, third black; thorax black;

abdomen black, the hindmargins of segments fringed with short yellow or white pubescence; legs deep brown; wings hyaline, the costal margin very narrowly brown.

Length. Female, 14.5 mm.; male, 15.5 mm.

Hab. Bagdad, Bellerive.

Female. Face yellowish-grey; beard white. Palpi long, brown. Antennæ with the first two joints brown, bearing short black hairs, the third black, and almost symmetrical. Eyes with short and sparse pubescence. Frontal stripe very slightly broader below than above, the centre black and shining, the sides and upper fourth covered with yellow-brown tomentum, the whole bearing a little short black pubescence; frontal triangle black, covered with yellow-brown tomentum; vertex excavated and almost bare. Thorax black, with black pubescence, and a few white hairs fringing posterior margins. Abdomen black, the hindmargins of segments fringed with short yellow or white pubescence. Legs with femora, tibiæ, and tarsi deep brown or brownish-black; posterior knees yellow, with a black streak below; femora bearing rather short black hairs, tibiæ with unusually short black hairs. Wings hyaline, with the costal margin very narrowly brown; the cubital fork without a recurrent veinlet.

Male resembles the female, but is of more slender build; the eyes are joined and densely hairy, the thorax bears long upright black hairs and depressed yellow hairs, the pubescence fringing the abdominal segments is more abundant, and extends along the outer margins, and the hairs clothing the legs are longer.

This is a very distinct species; it may be at once recognized by the absence of a recurrent veinlet to the cubital fork, by its large size, its uniform black colouration, and by the abdominal segments being merely fringed with yellowish pubescence, instead of, as in the other Tasmanian species, possessing distinct pale hindmargins. A nearly-allied Victorian species, *T. victoriensis*, *Ricardo*, is distinguished by having the veins of the wings broadly shaded with brown.

T. microdonta is generally scarce, but on February 13, 1913, in the bush at Bagdad, I saw several specimens of the male flying rapidly to and fro in the bright sunshine, and on the same day I came across another male in the clutches of a specimen of *Stenopogon elongatus* (*Asilidæ*). Of the female I have found two specimens, one in the bush near Bagdad, the other crawling on the sands at Bellerive. I have only met with it during February.

T. microdonta appears to be confined to Tasmania.

TABANUS SIMILIS, Macq.

This species is only known from the type specimen described by Macquart. It has been redescribed by Miss Ricardo (Ann. Mag. Nat. Hist., Nov. 1914, pp. 391-2), whose description is here appended:—

"A medium-sized yellowish species, with a narrow grey median stripe on a wider darker stripe on the yellowish abdomen. Antennæ, palpi, and legs all yellowish. Length, 12½ mm.

"Face covered with ashy-grey tomentum and some long pale hairs. Beard white. Palpi pale yellow, with sparse black pubescence, rather stout, ending in a point. Antennæ reddish yellow, the third joint (which is incomplete) with a distinct tooth, the first two joints paler in colour, with black pubescence. Forehead broad, about four times as long as it is wide anteriorly, almost parallel; frontal callus large, square, not reaching eyes, reddish brown, with a short lineal extension. Thorax drab in colour, with traces of lighter tomentum. Scutellum is similar. Abdomen (faded) warm buff-colour, with a broad median mummy-brown stripe, on which appears a narrow grey tomentose stripe; the apex and sides are also mummy-brown; underside very similar, but no stripes are visible. Legs reddish yellow. Wings clear, stigma yellow; no appendix present."

This species should be easy to recognize by the absence of a recurrent veinlet (or appendix) to the cubital fork, in conjunction with the striped abdomen and light colouration.

TABANUS LIMBATINERVIS, Macq.

A very large red-brown species, with all the wing-veins suffused with brown, and the first posterior cell closed.

Length. Female, 20 mm.

Miss Ricardo redescribes Macquart's type as follows:— "Palpi yellow with black pubescence, fairly stout throughout their length, ending in an obtuse point. Antennæ reddish, black at apex, with a well-defined tooth. Forehead about eight times as long as it is broad, parallel; frontal callus oblong, chestnut-red, reaching eyes, with a long lineal extension. Eyes apparently bare. Thorax (denuded) reddish with darker stripes. Abdomen reddish brown, the dorsal white spots very indistinct owing to denudation. Legs described by Macquart as black; the tibiæ yellow, the anterior and posterior pairs black at apices."

This species is not known to me personally. It should be easy to recognize from the closed first posterior cell, in conjunction with the large size. This is the only known Tasmanian species which has the first posterior cell closed.

TABANUS GENTILIS, Erich. (Fig. 13).

A small species with spotted wings. Frontal stripe much narrower above than below; thorax olive-black, striped with grey; abdomen brownish-black, with pale grey hindmargins, and a row of whitish centre-spots; legs brown; wings with four brown spots.

Length. Female, 11 mm.; male, 10 mm.

Hab. Bagdad Valley.

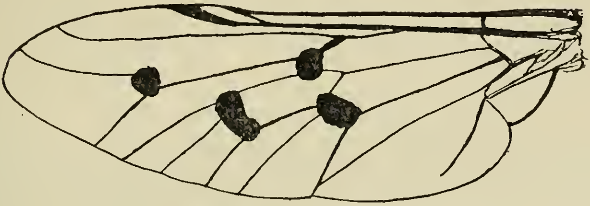

Fig. 13. Wing of *Tabanus gentilis*.

Female. Face white, with white pubescence and a few black hairs; beard white or yellowish-white. Palpi pale orange-brown. Antennæ varying greatly in colour, but usually some shade of brown with the apex black, the first joint as a rule lighter than the others; both first and second joints bear long black hairs. Eyes hairy. Frontal stripe much broader below than above, brown, dusted with grey, the lower part forming a shining brown callus, and the whole bearing abundant long black pubescence; frontal triangle short, grey. Thorax olive-black with five grey stripes, the whole bearing dense black pubescence, and the posterior portion and scutellum fringed with white hairs. Abdomen brownish-black, the first segment unicolorous, remaining segments with pale grey or pale brown hindmargins, and a row of whitish centre-spots, but both spots and hindmargins vary in extent in different specimens; the second segment also has the shoulders broadly pale grey. Legs with femora and tibiæ brown, tarsi dark brown; the hind femora viewed from above are orange-brown with the knees dark brown; all femora with long white hairs, the anterior pair bearing in addition short and long black hairs; tibiæ with long black pubescence. Wings with four brown spots, which are situated respectively on the base of the cubital fork, the outer margin of the discal cell, and the outer angles of the first and second basal cells; cubital fork with a recurrent veinlet.

Male resembles the female, but the eyes are joined and densely hairy, the face covered with dense black and white pubescence, antennæ blackish, thorax and sides of abdomen with abundant black pubescence, femora with long black hairs, and hind tibiæ with extremely long black pubescence.

This species may be readily distinguished from all the other Tasmanian species of *Tabanus* by its spotted wings. The females occur not uncommonly in the bush in the Bagdad Valley, but of the male I have only come across a single specimen, which was frequenting low bush flowers. This is the first Tasmanian species to appear on the wing; my dates range from November 17 to January 18. It also occurs in Victoria.

TABANUS TASMANIENSIS, Sp. nov.

A medium-sized, dark brown species with the wing-veins suffused with brown. Frontal stripe narrow at vertex, broad below; thorax black, striped with grey; abdomen broad and flat, deep brown, with the hindmargins of segments very broadly grey or pale brown; femora black; tibiæ light brown.

Length. Female, 12 mm.

Hab. Bagdad.

Female. Face grey, with black pubescence. Frontal stripe narrow above, broadening below, black, dusted with grey, the lower part forming a shining black callus, the whole bearing short and scanty black pubescence; frontal triangle grey. Palpi pale red or pale yellow, more than half the length of the proboscis. Antennæ with first, second, and base of third joint reddish-black, remainder deep black, the first bearing unusually long black hairs; the third joint slightly humped. Eyes hairy. Thorax olive-black, striped indistinctly with grey. Abdomen unusually broad and flattened, deep brown, the first segment unicolorous, remaining segments with hindmargins very broadly pale brown or grey, the second segment also with the fore margin grey on either side of the middle, the size of these grey patches varying in different specimens; there is also a row of whitish centre-spots, which may be wanting in dried specimens. Legs with femora blackish-brown, tibiæ pale brown, tarsi dark brown; femora with scanty white pubescence, tibiæ with black pubescence. Wings with the veins suffused with brown, and a distinct stigma; cubital fork with a recurrent veinlet.

This species may be distinguished from *T. limbatinervis, Macq.* (the only other Tasmanian species which has the wing-veins suffused with brown) by the first posterior cell being wide open, instead of closed, and by the much smaller size. Of the mainland species, the only one with which it can be confused is *T. victoriensis, Ricardo*; from this it may be distinguished by the presence of a recurrent veinlet to the cubital fork, the smaller size, and brown instead of black colouration.

T. tasmaniensis is apparently a local species. It occurs sparingly in the bush at Bagdad during February.

TABANUS ANTECEDENS, Walk.

A common, medium-sized, black and brown, black and grey, or slate-coloured species. Vertex bearing long black hairs; antennæ with first joint dark red or grey, second and third black; thorax olive-black, with four grey stripes; abdomen broad and flattened, black, with shoulders of second segment, and hindmargins of second and following segments very narrowly brown or grey; femora black, tibiæ brown, the pubescence of the tibiæ of very unequal length; wings hyaline.

Length. Female, 12-14 mm., usually about 13 mm.

Hab. Generally distributed.

Female. Face pale grey; beard scanty, white. Frontal stripe narrow, broadening gradually from the vertex to the frontal triangle, black, dusted with grey, the lower part forming a shining black callus; frontal triangle pale grey. Vertex bearing long black hairs. Palpi light yellow-brown, occasionally grey or pale orange, always more than half the length of the proboscis. Antennæ with the first joint dark red, occasionally grey, second and third black, the first two joints with long black hairs. Eyes hairy. Thorax olive-black, with four conspicuous pale grey stripes, the whole bearing long black pubescence. Abdomen black, with shoulders of second segment, and hindmargins of second and subsequent segments very narrowly pale reddish-brown or grey; there is also, in life, a row of pale centre-spots, but in dried specimens these are usually wanting; under-surface of abdomen grey. Legs with femora black, tibiæ brown or red-brown, tarsi black; the tibiæ bear black pubescence of unequal length, some short and some long, which is one of the distinguishing characteristics of the species, also some short white pubescence.

Wings clear; anterior veins dark brown; cubital fork with a recurrent veinlet.

This is the commonest Tasmanian species of *Tabanus*, but it is liable to be confused with both *T. edentulus* and *T. imperfectus*. From the latter it may be distinguished by its much larger size, by the long black hairs of the vertex, and by the pubescence of the tibiæ being of unequal length, some long and some short, instead of uniformly long. From *T. edentulus* it can only be distinguished with some difficulty; it is a broader species with a blackish instead of brownish abdomen, and without any sign of the yellow stigma which is usually present on the wings of *T. edentulus*; it is further distinguished by the long black hairs of the vertex, by the pubescence of the tibiæ being of unequal length, instead of uniformly short, and by the less distinct abdominal centre spots, which are often wanting, though always present and clearly defined in *T. edentulus*.

Walker's type of *T. antecedens* is from Tasmania, and the name is undoubtedly correct as applied to the Tasmanian form. From the mainland of Australia, however, come a large number of specimens of slightly different appearance, at present placed under the same name, which further investigation may perhaps divide into one or more additional species.

T. antecedens seems to be generally distributed in the Tasmanian bush. My dates range from December 31 to March 1.

TABANUS EDENTULUS, Macq.

A common species resembling *T. antecedens*, but browner, of more slender build, and with a row of clearly-defined abdominal spots. Vertex with short hairs; front black; antennæ with base brown, apex black; thorax black with four grey stripes, which are sometimes indistinct; abdomen brownish-black, with hindmargins of segments brown; femora black, tibiæ brown; wings clear, with a pale brown or yellow stigma.

Length. Female, 11.5-13.5 mm.

Hab. Bagdad Valley. (Probably generally distributed.)

Female. Face grey; beard white. Frontal stripe long and narrow, widening slightly below, black, dusted with grey except adjoining the frontal triangle, where it forms a shining black callus, the whole bearing short black pubescence, which is but little longer at the vertex than below; frontal triangle brown, usually bright and shining, but sometimes covered with grey tomentum. Palpi pale brown, with a reddish tinge. Proboscis directed inwards. Antennæ nearly symmetrical, the first and second joints and sometimes also base of the third brown, remainder black; the first two joints bear a little black pubescence. Eyes hairy. Thorax olive-black, with four dark grey stripes, which are sometimes indistinct, the whole bearing black and a little white pubescence. Abdomen brownish-black, with hindmargins of segments light brown, and a row of pale, clearly-defined centre spots; underside of abdomen with base grey, remainder pale reddish. Legs with femora black, the apex sometimes brown; tibiæ brown; tarsi brown or black; pubescence of femora white, with, sometimes, also a few black hairs; pubescence of tibiæ white and black, none of the black hairs being conspicuously longer than the others. Wings clear, anterior veins light brown, with a light brown or yellow stigma; cubital fork with a recurrent veinlet.

This species is not very easy to distinguish from *T. antecedens;* it is, however, a browner and more slender species, with distinct abdominal centre-spots, and with the base of the antennæ lighter; the vertex bears short instead of long black hairs, the black pubescence of the hind tibiæ is of nearly equal length, instead of some of the hairs being very much longer than the others, and the stigma is more distinct, and pale yellow-brown instead of black. From *T. imperfectus* it is distinguished by its larger size, browner colouration, the short tibial pubescence, and the yellower stigma.

T. edentulus is usually a common species in the bush in the late summer. It is the last species of *Tabanus* to appear on the wing. My dates range from February 28 to March 15. It also occurs in Victoria.

TABANUS IMPERFECTUS, Walk.

A very small, slender species with an olive-black abdomen. Antennæ with first joint grey, second grey or black, third black; thorax grey-black, with two light grey stripes; abdomen olive-black, with hindmargins of all segments, and (in the male) shoulders of second segment, light grey; femora dark brown, tibiæ olive-brown with apex and tarsi black; tibiæ with long hairs on the inner as well as the outer side; wings clear, the stigma usually indistinct.

Length. Female, 9 mm.; male, 9-11 mm.

Hab. Bagdad Valley. (Probably generally distributed.)

Female. Face grey, bulging out beneath the eyes and bearing many white and a few black hairs. Front slightly widened below, black, the upper two-thirds dusted with grey, the lower third forming a shining callus, pubescence very short and scanty. Palpi light brown. Antennæ with the first joint grey, the second grey or black, the third black, the two first bearing short black hairs. Eyes hairy. Thorax greyish-black, with two pale grey stripes, which are frequently indistinct, the anterior portion with scattered black hairs, remainder almost bare. Abdomen olive-black, with hindmargins of all segments light grey or brown. Legs with femora dark brown; tibiæ olive-brown with apex and tarsi black; femora with many long white hairs and a few black ones; hind tibiæ with long black hairs, which are long on the inner as well as the outer side Wings clear, with the stigma usually indistinct; cubital fork with a recurrent veinlet.

Variation. Although the usual colouring of the thorax is grey-black and the abdomen olive-black, I have one specimen in which the thorax is olive-black and the abdomen brown; this specimen also has the frontal callus deep brown instead of black.

Male differs chiefly in appearance from the female in having the eyes joined and densely hairy, the face covered with dense black hairs, the more hairy thorax, and in the abdomen having the shoulders and hindmargin of the second segment pale brown.

This is the smallest species of Tabanus known to occur in Tasmania; it may be readily recognized by its small size and slender shape. From *T. antecedens* it may be further distinguished (in the female) by the absence of the long hairs on the vertex, which are characteristic of that species, and from *T. edentulus* by the longer hairs of the hind tibiæ, which are long on the inner as well as the outer side.

T. imperfectus was described by Walker from "Australia," the exact locality not being given. I have examined the type in the British Museum, and find that the Tasmanian specimens agree with it in all particulars.

This is the one Tasmanian species of *Tabanus* in which the males are as commonly met with as the females. The former, and sometimes also the latter, may be found settled on sandy roads or warm hillsides; the females, however, as a rule seem to prefer more shady situations; I have never known them to attack people in any way. This species is by no means uncommon, though it seems to remain on the wing for only a short time; my dates range from January 24 to February 15.

TABANUS HOBARTIENSIS, Sp. nov.

A small, robust, dark brown species, resembling *T. antecedens* and *T. edentulus*, but having the hind femora orange above, with black knees, the wings short and broad, and the anal cell closed actually on the wing margin. Antennæ with first and second joints dark red, third black; frontal stripe black, short and broad; thorax black with four indistinct grey stripes; abdomen short, dark brown, with white centre spots.

Length. Female, 10.5 mm.

Hab. Hobart.

Female. Face light grey; beard yellowish-white. Frontal stripe black, broad, of almost equal breadth throughout, the upper two-thirds more or less dusted with brown, and bearing short black pubescence; frontal triangle pale red-brown, dusted with grey. Palpi pale brown. Antennæ with the first and second joints dark red, sometimes partly suffused with black, third black; the first joint bears long black hairs; under side of antennæ brown; the third joint has the base considerably broadened, but only slightly humped. Eyes hairy. Thorax black, with four indistinct grey stripes, the whole covered with dense short black pubescence, and a little short depressed white pubescence; sides of thorax with abundant long black hairs, posterior margin and scutellum fringed with long white hairs. Abdomen short and broad, dark brown, with hindmargins of second and subsequent segments light grey-brown; there is a row of ill-defined white centre-spots, and the sides are fringed with tufts of white and black hairs. Legs with hind femora orange above, with knees broadly black, the black sloping backwards to the lower side of the femora, so that the black of the knees is twice as broad below as above; femora below, and all tibiæ, light red-brown; tarsi black, with the base of first joint reddish; femora with long, dense black and white hairs; hind tibiæ with long black hairs. Wings clear, the veins dark brown; anal cell broad, and closed on the actual wing-margin; stigma dark brown and distinct.

The distinguishing character of this species is the colouring of the hind femora, in conjunction with the small size, dark brown colouration, short broad abdomen, broad anal cell closed on the wing margin, and the prominent dark brown stigma. These characters distinguish it from *T. antecedens*, *T. edentulus*, and *T. imperfectus*, to all of which it bears some resemblance. It is the only known Tasmanian species that has the anal cell closed on the wing margin, all the other species having it closed some way above the margin. From *T. edentulus*, to which it bears the closest resemblance, it is further distinguished by the much longer pubescence of the hind tibiæ. The colouring of the hind femora resembles that of *T. gentilis*, but the latter species is distinguished by its spotted wings.

T. hobartiensis I have only met with at the Cascades. Hobart, where it occurs very sparingly; time of occurrence, December and January.

TABANUS CIRCUMDATUS, Walk.

A large species with black thorax, striped with grey, and red-brown abdomen. Frontal stripe of equal breadth throughout; antennæ with first two joints reddish, third black and considerably humped; femora black, tibiæ red-brown; wings clear.

Length. Female, 15 mm.

Hab. Tasmania (generally distributed).

Female. Face white, nearly bare; beard yellowish-white. Frontal stripe of equal breadth throughout, brown, dusted with grey, the lower third forming a shining brown callus, which is continued upwards centrally. Palpi varying somewhat in colour from dull orange to dull reddish-brown. Antennæ with the third joint considerably humped; the first two joints reddish, sometimes very dark, third joint black, the first and second bearing short black hairs. Eyes hairy. Thorax black, with two central and two side grey-stripes, the whole bearing black pubescence; posterior borders and scutellum fringed with long white hairs. Abdomen red-brown, with a row of centre spots of yellowish-white pubescence; there is also a conspicuous black central spot on the second segment; the hindmargins of the segments are usually paler than the remainder of the dorsum, but not conspicuously so, and they bear yellowish-white pubescence on their outer parts. Legs with femora black, to some extent covered with grey tomentum, the knees and tibiæ red-brown, tarsi black; femora with dense white hairs, which are particularly long on the anterior pair; hind tibiæ with short black pubescence. Wings clear; cubital fork with a somewhat long recurrent veinlet.

Male generally resembles the female, but is more hairy; the eyes are joined, and the abdomen narrower and more pointed.

Variation. A female from Bagdad differs considerably from the type; the third joint of antennæ is nearly symmetrical, the frontal callus black instead of brown, the black dorsal spot on the second abdominal segment is greatly expanded, and there is an additional black spot on each outer margin of the same segment and the legs are lighter. Another female from Mangalore shows these same three abdominal spots, the remainder of the segment being bright orange-brown, whilst the other segments are black with bright orange-brown hindmargins. Specimens from Victoria also show considerable variation; they are usually rather smaller and more brightly coloured than the typical Tasmanian form, the colouring of the abdomen varying from orange-brown with a row of black dorsal spots to black with hindmargins of segments orange-brown. Rubbed specimens are often lighter in colour than those in fresh condition.

This species may be easily recognized by its large size and red-brown abdomen, and can hardly be confused with any of the other Tasmanian species. It is a common species and seems to be generally distributed. It is also common in Victoria. My dates range from January 18 to March 2.

TABANUS VETUSTUS, Walk.

A sand-coloured species frequenting sandhills on the coast. Thorax dull black, abdomen either entirely pale yellow-brown, or with centre blackish and sides yellow-brown, but the whole of the thorax and abdomen covered with very short, depressed, pale yellow pubescence, which gives it a uniform sand-coloured appearance. Antennæ with two first joints reddish-yellow, third black; femora black; tibiæ yellow; wings clear with pale veins.

Length. Female, 13-14 mm.

Hab. Bellerive.

Female. Face and beard yellowish-white, the latter short. Palpi pale orange. Antennæ practically bare, the first two joints reddish-yellow, third black; the third joint slightly humped. Eyes hairy, in life a brilliant red and green. Frontal stripe long, of almost equal breadth throughout, black, and in undenuded specimens covered with yellow-brown tomentum, with the exception of a small callus towards the base; frontal triangle orange-brown, but, in undenuded specimens, completely covered with yellow-brown tomentum. Thorax dull black, covered with short, depressed, pale yellow pubescence, with sides, posterior margins, and scutellum fringed with long similarly coloured hairs. Abdomen slender; the ground colour light yellow-brown, with or without a broad blackish dorsal stripe, which may occupy the whole of the apical half, but in any case the whole dorsum is covered with short, depressed, pale yellow pubescence, which gives it a sand-coloured appearance. Femora, except the apex, black with white pubescence; apices of femora, the whole of the tibiæ, and first joint of tarsi, brownish-yellow; remaining tarsal joints brown; the hind tibiæ bear scattered black hairs interspersed with dense shining white pubescence. Wings large and clear, with the veins unusually pale; stigma light yellow-brown; cubital fork with a recurrent veinlet.

The Tasmanian specimens of *T. vetustus* differ from Walker's type, which is from Western Australia, in having the third antennal joint entirely black, instead of reddish-yellow with only the tip black, but they agree with it in all other respects. I have also seen a specimen from New South Wales, kindly sent me for examination by Dr. Ferguson, so the species seems to be of very wide distribution.

T. vetustus frequents sandhills on the coast, in which situations its colouring is clearly protective. It occurs during February, but does not seem to be common.

TABANUS CYANEUS, Wied.

Syn. *Tabanus cyaneoviridis*, Macq.

Abdomen metallic blue-black; antennæ with first and second joints black, third bright reddish-yellow; face, front, and legs black; wings with the base brown, stigma yellow.

Length. Female, 13-14 mm.

This species can be readily distinguished from all the other Australian species of *Tabanus* by its shining metallic blue-black colouration. A specimen was described by Macquart from Tasmania, but I have not come across the species personally. It also occurs in New South Wales and Queensland.

In addition to the foregoing, the three following species of *Tabanus* have been described from Tasmania:—*T. exulans*, *Erichs*, *T. fraterculus*, *Macq.*, and *T. gregarius*, *Erichs*; none of the types of these species can be traced, and as the published descriptions are inadequate for purposes of identification, it is necessary for the species to be deleted.

17. CHRYSOPS, Meig. (Fig. 12c).

Black and yellow flies, with conspicuously banded wings.

Eyes joined in the male, separated in the female, usually bare and spotted with brown or purple in a definite arrangement. Antennæ considerably longer than the head, basal joint dilated and slightly longer than the second, both hairy; the third joint bare and slightly longer than the first two together, with five distinct annulations, the basal one being about as long as the four following. Thorax nearly quadrangular, with rounded corners. Abdomen with the second segment longest, the following segments gradually diminishing in length; colouring usually black with orange markings, which differ in the two sexes. Legs with two spurs on each of the middle and hind tibiæ. Wings with conspicuous black bands, which are more extended in the male than in the female.

One species belonging to this genus has been described from Tasmania; it is the only one known to occur in the Australasian region.

CHRYSOPS TESTACEUS, Macq.

This species is described as having the abdomen testaceous-brown, with yellow spots; wings with a dark transverse band, and an apical spot.

It is unknown to me.

PANGONIA, Latr. (Fig. 12b).

The genus *Pangonia* (sensu lato) is distinguished by having the hind tibiæ spurred, the third joint of antennæ with eight annulations, of which the first is broad and short, and by the much-produced proboscis, with small pointed sucker-flaps.

Eyes either bare or hairy, joined in the male, separated in the female. Thorax broad and robust. Abdomen very broad and short, slightly pointed in the male, rounded in the female. Wings with the anal cell closed, the first posterior cell either closed or open.

The habits of the species of *Pangonia* are similar to those of the genus *Tabanus*. The males, which are much rarer than the females, frequent flowers, whilst the females attack intruders into their resorts in the same way as those of *Tabanus*, but they may also be found in situations similar to those of the males.

Pangonia is an enormous genus of world-wide distribution; for the sake of convenience it is split up into the following subsidiary genera:—

1. Wings with the first posterior cell closed. 2
2. Eyes bare. PANGONIA, Latr.
   Eyes hairy. EREPHOPSIS, Ricardo.
 Wings with the first posterior cell open. 3

3. Eyes bare. CORIZONEURA, Ricardo.
Eyes hairy. DIATOMINEURA, Rondani.

Only the last two genera are known to occur in Tasmania.

18. CORIZONEURA, Ricardo.

Wings with the first posterior cell open; eyes bare.

Two species are known to occur in Tasmania; a third (*C. dives, Macq.*) has also been described, but I think that this is probably only a denuded specimen of *Diatomineura auriflua, Donovan.*

Table of the Tasmanian Species of Corizoneura.

1. Thorax and abdomen black. 2
2. Legs black; very small species. ANTHRACINA, Macq.
Legs red; large species. RUFOVITTATA, Macq.

CORIZONEURA ANTHRACINA, Macq.

This species is described by Macquart as having the thorax, abdomen, and legs black, and wings darkened.

Length, 7 mm.

CORIZONEURA RUFOVITTATA, Macq.

This species is described by Macquart as having the antennæ red; thorax black with red stripes; abdomen black with incisions red; legs red; wings yellow.

Length, 16 mm.

19. DIATOMINEURA, Rondani.

Wings with the first posterior cell open; eyes hairy.

Table of the Tasmanian Species of Diatomineura.

1. Antennæ black. 2
Antennæ red. 3
2. Abdomen black, with yellow or golden centre-spots. AURIFLUA, Donovan.
Abdomen violet-brown, with white centre-spots. IANTHINA, Sp. nov.
3. Abdomen brown or tawny; femora yellow; length of proboscis, 3 mm. CONSTANS, Walk.
Abdomen testaceous; femora red; length of proboscis, 5 mm. SUBAPPENDICULATA, Macq.
Abdomen testaceous; femora black; length of proboscis, 4 mm. DORSOMACULATA, Macq.
Abdomen bright violet. VIOLACEA, Macq.

DIATOMINEURA AURIFLUA, Donovan.

Syn. *Pangonia solida*, Walk.

Syn. *Pangonia dives*, Macq.

Antennæ black; thorax grey-brown (♂) or black (♀), fringed with golden hairs; abdomen black with sides and centre-spots yellow or golden; legs dark brown or black; wings hyaline.

Length. Female, 14 mm.; male, 15 mm.

Length of proboscis. Female, 3 mm.; male, 2.5 mm.

Hab. Tasmania and Eastern Coast of Australia.

Female. Front dark grey, dusted below and at sides with light grey. Antennæ and proboscis black; palpi rich brown. Thorax black, with three light grey stripes, the whole fringed with golden hairs, and with a patch of black hairs on each side before the base of the wings; scutellum light grey. Abdomen black, with sides, centre-spots, and hindmargins of second to fifth segments covered with yellow shining pubescence, sixth segment with golden pubescence. Legs brownish-black, the femora bearing abundant pale yellow pubescence. Wings hyaline, the cubital fork without a recurrent veinlet.

Male resembles the female, but the eyes are joined and are more hairy, the thorax is browner and more pubescent, the abdominal centre-spots and margins are bright golden, and the legs are browner.

This species is easily distinguished by its black and gold abdomen and wholly black antennæ. It seems to be widely distributed in Tasmania, but is not common. The males particularly affect box tree blossom.

Pangonia dives, Macq., which I have placed under *D. auriflua*, has previously been listed under the genus *Corizoneura*; it was, however, described by Macquart as having hairy eyes, so it cannot belong to that genus, and as Macquart's description agrees exactly with that of *D. auriflua*, I consider that it is probably identical with this species.

DIATOMINEURA IANTHINA, Sp. nov.

Antennæ and palpi black; thorax olive-black, with three light grey stripes; abdomen deep violet-brown, with white centre-spots; legs deep brown; wings hyaline.

Length. Female, 14 mm.

Length of proboscis, 4.75 mm.

Hab. Mangalore.

Female. Face grey, with a few scattered black hairs;

beard of abundant long white hairs. Front olive-black. Antennæ with first joint dark grey-brown, second and third deep black; the first two joints bear long black hairs. Palpi brownish-black, the second joint unusually slender and a little longer than the first. Proboscis black, long, and projecting forwards. Thorax and scutellum olive-black, the former with three clearly-defined light grey stripes, the dorsum bearing dense black pubescence, the shoulders with black hairs, and posterior margins and scutellum fringed with long white hairs. Abdomen deep violet-brown; the first segment deep brown in centre and reddish-brown at sides, remaining segments dark violet-brown with paler hindmargins, that of the second segment distinct and fringed with short white and yellow hairs, those of the remaining segments indistinct, the whole bearing a row of white centre-spots. Legs entirely deep brown, but the knees beneath are a light yellow-brown. Wings hyaline, the cubital fork without a recurrent veinlet.

This species is distinguished from all the other Tasmanian species of *Diatomineura* (except *D. auriflua*) by the black antennæ; from *D. auriflua* it is distinguished by the abdomen being violet-brown with white spots instead of black with golden spots. It is also quite distinct from any of the mainland species.

D. ianthina is only known from a single specimen, which occurred settled on the blossoms of a flowering shrub on the highest part of the hills that bound the Bagdad Valley on its eastern side. It was taken on January 26, 1912.

DIATOMINEURA CONSTANS, Walk.

Syn. *Pangonia ruficornis*, Macq.

A common, very variable species. Antennæ bright red, thorax deep brown, with three grey or yellow stripes; abdomen orange, golden, brown, or tawny, with or without a broad black dorsal stripe, and with indistinct whitish centre-spots; femora yellow, tibiæ yellow-brown; wings with the costal margin tinged with brown.

Length. Female, 11.5-12.5 mm.; male, 11 mm.

Length of proboscis, 3 mm.

Hab. Tasmania (generally distributed).

Female. Front black, dusted partly or completely with grey tomentum. Antennæ with the two first joints grey, with long black hairs, third bright red. Palpi orange, the second joint concave above, broad at the base and tapering to a pointed apex. Thorax deep brown, with three grey or yellow stripes, fringed posteriorly with dense pale yellow hairs, and with black hairs on each side before the base of the wings; the dorsum bears short black and golden pubescence; scutellum brown. Abdomen dark brown, golden, or orange, or deep black-brown with the base on either side orange-brown, or tawny with a black dorsal stripe, those specimens occurring near the coast seeming to be more brightly coloured than those found inland; in all cases there is a row of light yellow or yellowish-white centre-spots. Legs with femora yellow, tibiæ yellow-brown, sometimes with a reddish tinge, tarsi brown. Wings with the costal margin tinged with brown.

Male very seldom met with; the only specimen known has the eyes joined and more hairy than in the female; abdomen golden; femora and tibiæ golden-yellow; colouring in other respects as in the female.

Walker's type of *D. constans* in the British Museum is tawny, with a black dorsal stripe, and costal margin of wings rather more suffused than in the average Tasmanian specimens, but in other respects it seems to agree with the species here described; Macquart's description of *P. ruficornis* also seems to refer to the same species. The distinguishing characters are the general brownish or tawny colouration, in conjunction with the red antennæ, yellow legs, and comparatively short proboscis.

This is a common species, and seems to be generally distributed in the Tasmanian bush. It is not known to occur outside Tasmania. My dates range from December 26 to January 26.

DIATOMINEURA SUBAPPENDICULATA, Macq.

This species is described by Macquart as having the antennæ red; thorax black; abdomen testaceous with yellow dorsal spots; legs red.

Length. Female, 14 mm.

Length of proboscis, 5 mm.

DIATOMINEURA DORSOMACULATA, Macq.

This species is described by Macquart as having the antennæ red; thorax black with ashy pubescence; abdomen testaceous, with black and white dorsal spots; femora black, tibiæ testaceous.

Length. Male, 10 mm.

Length of proboscis, 4 mm.

Diatomineura violacea, Macq.

This species is described by Macquart as having the antennæ red; abdomen a brilliant violet with green reflections; wings a little brownish.

Length. Female, 7 mm.

20. Pelecorhynchus, Macq.

This genus is distinguished by the hatchet-shaped proboscis, subulated antennæ, curved anal vein of wing, and open anal cell. The species are of large size, and several have boldly spotted wings.

For our knowledge of this genus we are mainly indebted to Miss G. Ricardo's "*Revision of the Genus Pelecorhynchus of the Family Tabanidæ*" (Ann. Mag. Nat. Hist., May, 1910), in which all the species are described. Eight species are known, six of these being from Australia and two from Chili; of the Australian species two occur in Tasmania; both of these are of considerable rarity.

Table of the Tasmanian Species of Pelecorhynchus.

1. Wings spotted. 2

2. Abdomen with interrupted whitish bands; thorax with two white spots on black stripes. Eristaloides, Walk.

Abdomen with entire whitish bands; thorax unspotted. Nigripennis, Ricardo.

Pelecorhynchus eristaloides, Walk.

Thorax greyish-brown, with two elongated white spots, each situated on a black stripe, hairs at sides black; abdomen with white bands on the second, third, and fourth segments, which are interrupted in the middle; wings boldly spotted.

Length, 15-20 mm.

Hab. Tasmania and Australian mainland.

Pelecorhynchus nigripennis, Ricardo.

Thorax blackish-brown, with red hairs at sides, and altogether unspotted; abdomen blackish-brown, the second, third, and fourth segments with white bands, which are entire; wings boldly spotted.

Length, 18 mm.

Hab. Tasmania, Victoria, and New South Wales.

Family VI. THEREVIDÆ.

Flies of moderate size, of elongated or conical shape, the thorax and legs with distinct bristles; distinguished from the *Asilidæ* by the eyes not being protuberant from a sunk vertex, and by the head being set close against the thorax, instead of being attached thereto by a slender neck. Head about the same breadth as the thorax; antennæ composed of three joints, with an apical style; eyes either touching or separated in the male, always widely separated in the female. Thorax distinctly longer than broad, with presutural, suproalar, postalar, and prescutellar bristles; scutellum with one or two pairs of marginal bristles. Abdomen either conical, or long and tapering. Legs slender, rather long, with distinct bristles. Wings with a venation resembling that of the *Leptidæ*; the first posterior cell is always open, and the anal cell always closed, but the fourth posterior cell may be either closed or open.

In the event of any difficulty being experienced in distinguishing between the *Leptidæ* and *Therevidæ* which have a similar venation, it may be noted that in the former family the thorax is quite without bristles, whilst in the latter they are large and well developed.

The division of this family into satisfactory genera is somewhat difficult. Williston refers to this question in his "*Manuel of North American Diptera*" (1908), in which he states:—"Few structural differences exist, save in the antennæ and proboscis, and these differences seem usually to have specific value only." An examination of the Tasmanian forms serves merely to confirm this statement, and it seems unsafe to form a genus on any single character. For our knowledge of the Australian forms we are largely indebted to O. von Kröber's "*Thereviden der Indo-Australischen Region*" (Entomologische Mitteilungen, 1912), in which a number of new genera were proposed. Some of these are certainly founded on satisfactory characters, but in other cases I am unable to appreciate the distinctions, more especially in those founded on the form of the antennæ, a character that I consider usually to be of specific value only. As an example of the unreliability of the antennæ as a generic character, I might refer to the two Tasmanian species of *Phycus*, both of which are now described for the first time. (See figures 14 and 15.) The antennæ in these two species are so different that if a classification were based on this character alone they might be easily placed in different genera, whereas they are really so nearly allied that the antennæ form almost the only distinguishing character. On the other hand, the antennæ of *Phycus imitans* and of *Ectinorrhynchus phyciformis* are so much alike that they might easily be placed in the same genus, whereas an examination of the other characters shows that there is very little relationship between them. Although, however, the form of the antennæ is of little use in classifying the genera, it is yet of great value in distinguishing the different species. The situation of the antennæ, however (whether arising from the middle or lower part of the face), is a satisfactory generic character.

In classifying the genera the form and venation of the wings seems to me to be of great importance. In the classification here adopted a single wing is all that is necessary in order to ascribe any species to its correct genus. The wings may have the fourth posterior cell either open or closed, may be large and broad or short and narrow, may have the veins faint or very prominently marked, and may be hyaline or banded with black or brown. Next in importance to the wings as a generic character comes the relative positions of the eyes, which may be widely separated in both sexes, or joined, or closely approximated, in the male and widely separated in the female. Finally, the form of the proboscis is of considerable importance; this may project prominently forwards, lie close against the face, or be altogether concealed within the oral aperture; this character, however, must be used with a certain degree of caution, as not infrequently a genus may contain an aberrant species which differs considerably in the form of the proboscis from the more normal species, although it agrees with them in its other characteristics.

A curious secondary sexual character that occurs in certain males of *Ectinorrhynchus* and *Psilocephala* is a silvery shimmering tomentum that covers all or part of the dorsal surface of the abdomen. This character makes the males very conspicuous when in flight; it is altogether wanting in the females.

The species belonging to this family are usually sluggish in their habits, and may more usually be met with at rest than on the wing. A number of species may be found settled on the ground in sandy places, whilst others frequent logs, tree trunks, or low vegetation. The males of *Ectinorrhynchus variabilis* may be found dancing in the air with their long hind legs hanging down. Several of the species bear a resemblance to *Hymenoptera*, the resemblance being increased by a curious habit possessed by species of *Phycus* and *Ectinorrhynchus* of waving their front legs to and fro, giving them the appearance of *Hymenoptera* with waving antennæ.

The Tasmanian species may all be referred to six genera, five of which occur also on the mainland of Australia, whilst the sixth, now described for the first time, appears to be confined to Tasmania.

Table of the Tasmanian Genera of Therevidæ.

1. Antennæ very long, the first joint usually longer than the head; fourth posterior cell of wings closed. Phycus, Walk.

Antennæ not very long, the first joint never longer than the head, and usually much shorter. 2

2. Proboscis projecting prominently forwards. 3

3. Wings large and broad; brightly coloured species; fourth posterior cell open. Ectinorrhynchus, Macq.

Wings small and narrow; black species; fourth posterior cell closed. Lonchorhynchus, Gen. nov.

Proboscis not projecting prominently forwards, and frequently entirely concealed within the oral aperture. 4

4. Eyes widely separated in both sexes; front hairy; short robust species; fourth posterior cell open. Anabarrhynchus, Macq.

Eyes joined or closely approximated in the male, widely separated in the female; front bare; long slender species. 5

5. Fourth posterior cell open; usually medium-sized species. Psilocephala, Zett.

Fourth posterior cell closed; very small species. Parapsilocephala, Kröb.

Alternative Table of the Tasmanian Genera of Therevidæ.

1. Wings with the fourth posterior cell closed. 2

Wings with the fourth posterior cell open. 4

2. Antennæ very long, the first joint usually longer than the head. Phycus, Walk.

Antennæ short, the first joint much shorter than the head. 3

3. Proboscis projecting prominently forwards; medium-sized species. Lonchorhynchus, Gen. nov.

Proboscis not projecting forwards; very small species. PARAPSILOCEPHALA, Kröb.

4. Proboscis projecting prominently forwards; wings banded. ECTINORRHYNCHUS, Macq.

Proboscis not projecting prominently forwards. 5

5. Eyes widely separated in both sexes; front hairy; robust species. ANABARRHYNCHUS, Macq.

Eyes joined in male, widely separated in female; front bare; slender species. PSILOCEPHALA, Zett.

21. PHYCUS, Walk.

Syn. *Salentia*, A. Costa.

Slender flies with extremely long antennæ, the first joint being usually much longer than the head, the second extremely small, the third usually shorter than the first; fourth posterior cell of wings closed.

Head broader than the thorax; front bare. Proboscis about the same length as the head, projecting forwards. Palpi a little shorter than the proboscis. Antennæ set about the middle of the head in profile, long and thin, the first joint usually longer than the head, the second very short, the third usually shorter, but sometimes longer, than the first. Eyes bare, separated in both sexes, somewhat narrowly in the male, but more widely in the female. Thorax longer than broad, nearly bare. Abdomen conical, bare; genitalia of the male large and elevated above the abdomen, of the female retracted, and almost covered by the anal segment. Legs of moderate length, bearing a few small bristles. Wings short, usually banded or mottled; fourth posterior cell closed.

Phycus may be readily distinguished from the other Tasmanian genera by the very long antennæ in conjunction with the closed fourth posterior cell. The only other Australian genus with very long antennæ is *Agapophytus*, which is distinguished by having the third antennal joint greatly broadened and compressed at the apex. One of the Tasmanian species of *Phycus* (*P. quatiens*) seems to be somewhat intermediate between *Phycus* and *Agapophytus*.

Table of the Tasmanian Species of Phycus.

1. Antennæ black, the first joint longer than the third. QUATIENS, Sp. nov.

2. Antennæ orange, the first joint shorter than the third. IMITANS, Sp. nov.

PHYCUS QUATIENS, Sp. nov. (Fig. 14).

Antennæ black, the first joint much longer than the third; front and thorax black; abdomen black, with anal segment yellow; legs bright orange-yellow; wings hyaline, mottled with grey-brown.

Length. Male, 7-9 mm.; female, 10 mm.

Hab. Bagdad Valley.

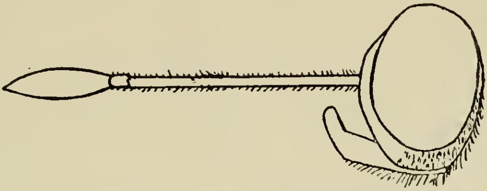

Fig. 14. Head of *Phycus quatiens.*

Male. Face and front black and shining; back of head black and shining with black bristles. Proboscis and palpi black, with short stiff hairs. Antennæ black, the first joint orange-brown at the extreme base; the first joint about twice the length of the head, the second very short, the third somewhat inflated, about half the length of the first. Eyes bare, separated, fringed below and behind with white hairs. Thorax black, somewhat shining, with black pubescence; scutellum velvet black with two black terminal bristles. Abdomen with the first segment grey, second and third dull brownish-black, fourth, fifth, and sixth shining jet black, genitalia orange-yellow. Legs with the femora, tibiæ, and first joint of tarsi bright orange-yellow, remaining joints of tarsi brown or black; there is also a narrow black stripe on the under side of the hind femora. Wings with both the fourth posterior and the anal cells closed at a considerable distance from the wing margin; there is a broad irregular grey-brown band across the middle and basal portion of the wing, leaving the actual base of the wing, the apex of the first basal cell, and the greater part of the fifth posterior cell, hyaline; wing-tip hyaline with a suffused spot covering the lower part of the cubital fork.

Female resembles the male very closely, but the eyes are more widely separated and the abdomen longer and more pointed; colouring of the body, legs, and wings as in the male.

Two other Australian species of *Phycus* have been described — *P. dioctriæformis, Schin.*, and *P. pallidicornis, Kröb.* — both from New South Wales; from the former of these *P. quatiens* may be distinguished by having the femora and hind tibiæ orange-yellow instead of black-brown, from the latter by the antennæ being black, with the third joint only half the length of the first, instead of pale yellow, with the first and third joints of almost equal length, and finally from *P. imitans*, next to be described, by the antennæ being black instead of orange, and by the first joint being longer than the third instead of vice versa.

P. quatiens may be found settled on, or flying about, logs in the bush. It has a habit when at rest of waving its fore legs to and fro, which gives it the appearance of a hymenopteron with waving antennæ. The males occur not uncommonly in the bush round the Bagdad Valley, and seem to be gregarious. The females are extremely rare; during four seasons' collecting I have only found a single specimen; it occurred settled on a log, in a similar situation to that frequented by the males. My dates range from October 26 to December 29.

PHYCUS IMITANS, Sp. nov. (Fig. 15).

Antennæ orange, the first joint shorter than the third; front and thorax black; abdomen black, with anal segment yellow; legs orange, anterior and middle tarsi yellow; wings hyaline with two black transverse bands across the middle, and a suffused spot towards the tip.

Length. Female, 10 mm.

Hab. Wedge Bay.

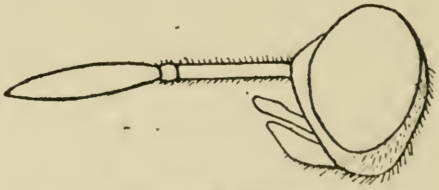

Fig. 15. Head of *Phycus imitans.*

Female. Head produced in front; face and front black, the latter shining on the lower half and at vertex, between which it is rugose; back of head black and shining. Proboscis orange-brown; palpi bright orange, unusually large, and extending beyond the proboscis. Antennæ orange, the third joint with the tip black and base brownish; the first joint, which bears black bristles, is a little shorter than the head, the second joint very short, the third broader and longer than the first. Thorax black, very lightly dusted with grey, and bearing short black pubescence. Abdomen black, with anal segment yellow; first segment covered with grey tomentum, second and third deep black, the former with a broad, the latter with a narrow, pale hindmargin; fourth, fifth, and sixth segments lightly dusted with grey; anal segment yellow; genitalia retracted and barely extending beyond the anal segment. Legs with the femora orange, bearing a broad black stripe beneath; tibiæ orange, the anterior and middle pairs with a few, the posterior pair with many, black bristles; anterior and middle tarsi yellow, posterior tarsi orange. Wings hyaline with two black, irregular, transverse bands, the first crossing the basal cells, the second extending from the costa to the end of the fourth posterior cell, the two bands being confluent for a short space at the apex of the second basal cell; there is also a small suffused blackish band crossing the cubital fork towards the wing-tip.

This species is easily distinguished from *P. quatiens* by the antennæ being orange instead of black, and by the third joint being longer than the first, instead of vice versa. From *P. dioctriæformis* it is distinguished by the orange instead of black-brown legs, and from *P. pallidicornis* by the third antennal joint being distinctly longer than the first, instead of about the same length, and by the colouring being orange with a black tip, instead of uniform pale yellow, by the thorax being black with black pubescence, instead of brown with white pubescence, by the anal segment of abdomen being orange, instead of dark brown, and by the wings being distinctly banded with black, instead of merely tinged with brown.

P. imitans is only known from a single specimen, which was taken by Mr. G. H. Hardy at Wedge Bay on January 3, 1914.

22. ECTINORRHYNCHUS, Macq.

This genus is distinguished by having the proboscis projecting prominently forwards, in conjunction with the long, more or less brightly-coloured abdomen, finely banded wings, open fourth posterior cell, and long legs.

Head short, slightly broader than the thorax. Proboscis and palpi projecting prominently forwards, the former more than twice the length of the latter. Antennæ varying in the different species, the first joint short or long, the second very short, the third long and terminated by a very small almost circular style. Thorax much longer than broad. Abdomen long and almost parallel-sided in the male, very long and tapering in the female. Legs very long, particularly the posterior pair. Wings large, broad, finely banded, and having the fourth posterior cell open.

Nine species have been described as belonging to this genus, six of these being from Australia, two from South Africa, and one from South America. Of the Australian species, however, *E. terminalis*, *Walk.*, is the same as *E. variabilis*, *Macq.*, and one or two of the other species are not, I think, correctly referred to this genus. *E. rufipes*, *Kröb.*, I consider to be more nearly related to *Phycus*. The specimen from which von Kröber took his description seems to have had the third antennal joint wanting; a specimen in my possession shows this to be almost the same as in the species for which he founded the genus *Tænogera*, which has a venation similar to that of *Ectinorrhynchus*. These two genera I am unable to separate. *E. rufipes*, however, in its venation, position of the antennæ, which are situated about the middle of the face; legs and shape and banding of the wings, agrees with *Phycus* and disagrees with *Ectinorrhynchus*, whilst the form of the antennæ is intermediate between them, and its only agreement with *Ectinorrhynchus* seems to lie with the lengthened proboscis, which does not, I think, indicate any real affinity.

In Tasmania two species are known to occur, both of them being also found on the Australian mainland.

Table of the Tasmanian Species of Ectinorrhynchus.

1. Scutellum black; abdomen black with silvery tomentum (♂); or black with apex reddish-yellow (♀). VARIABILIS, Macq.
2. Scutellum orange-red; abdomen orange-red in both sexes, covered in the male with silvery tomentum. PHYCIFORMIS, Sp. nov.

ECTINORRHYNCHUS VARIABILIS, Macq. (Fig. 16).

Syn. *Xylophagus terminalis*, Walk.

Syn. *Dimassus terminalis*, Walk.

Front black; antennæ with first joint dull red, second and third black; thorax black, striped with light brown; scutellum black, with hindmargin brown; abdomen in male black, covered with silvery tomentum, in female black with the apex reddish-yellow; all femora and posterior tibiæ bright yellow-brown; anterior and middle tibiæ yellow; wings brownish with two broad brown bands.

Length. Male, 10 mm.; female, 12 mm.

Hab. Generally distributed in Tasmania, and occurring also in Victoria and New South Wales.

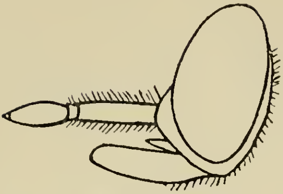

Fig. 16. Head of *Ectinorrhynchus variabilis.*

Male. Head very short and excavated behind; front black, projecting forwards; antennæ set very low, so that the face is chiefly occupied by the proboscis and palpi, which are black and yellow respectively. Antennæ with the first joint long, dull red, covered with long black hairs; second very short, black with black bristles; third black, almost bare, a little shorter than the first, expanded in the middle, tapering towards the apex, and terminated by a very small, nearly round, style. Eyes separated, but not very widely. Thorax black, with four light yellow-brown tomentose stripes, the two middle ones being the longest and the most distinct; the space between the two middle stripes is always deep black, but that between the middle and the outer stripes may be partly covered with brownish tomentum; the posterior portion of the thorax is also covered with a patch of very light yellow-brown tomentum; sides of thorax black; scutellum brownish-black, with posterior margin brown, and bearing two long black marginal bristles. Abdomen black, covered, particularly on the central segments, with a silvery tomentum; genitalia reddish-yellow. Legs: femora bright yellow-brown, anterior and middle tibiæ yellow, posterior tibiæ bright yellow-brown, all bearing black bristles; tarsi black, the first joint of the middle pair indistinctly, and of the posterior pair distinctly, whitish at base. Wings generally tinged with brown, and with an irregular brown band across the middle of the wing, and a broader one extending almost to the wing-tip; fourth posterior cell wide open.

Female differs very much in appearance from the male; the eyes are much more widely separated, and the abdomen is black with the apex reddish-yellow, and without any trace of silvery tomentum.

This species can be distinguished at once from *E. phyciformis* (next to be described) by the scutellum and abdomen being black instead of orange-red, and by the shorter antennæ.

E. variabilis occurs commonly in the Tasmanian bush. The male is more frequently seen than the female, but both sexes may sometimes be found in considerable numbers settled on bracken and other low vegetation. They have a habit, when settled, of waving their front legs to and fro, giving them the appearance of *hymenoptera* with waving antennæ. The males may also sometimes be seen dancing in the air, with their long hind legs hanging down.

E. variabilis is a spring species, occurring from early October to the end of November.

ECTINORRHYNCHUS PHYCIFORMIS, Sp. nov. (Fig. 17).

Antennæ greatly elongated; front black; thorax black, with two yellow tomentose stripes; scutellum orange-red; abdomen orange-red, covered in the male by a silvery shimmering tomentum; femora and tibiæ orange; tarsi black, with basal half of first joint white.

Length. Male, 11 mm.; female, 12 mm.

Hab. Hobart, Wedge Bay (also in Victoria).

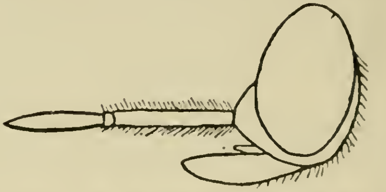

Fig. 17. Head of *Ectinorrhynchus phyciformis*.

Male. Head short, but longer than in *E. variabilis*; front black and shining. Proboscis brown; palpi light brown. Antennæ much elongated, the first joint narrow, about the length of the head, the second very short, the third broad, shorter than the first; the first joint is brown at the base, remainder of first joint and all of second and third joints black. Eyes separated, but not very widely. Thorax shining black, with two indistinct tomentose stripes, and a patch on posterior margin, yellow; scutellum orange-red, with a black patch on each side. Abdomen orange-red, the second to fifth segments covered with a silvery shimmering tomentum. Legs with anterior and middle femora orange; anterior and middle tibiæ yellow; posterior femora and tibiæ orange-red, the latter blackish at the base; tarsi black, the first joint with basal half white. Wings brown, darkest at the tips, with a lighter patch almost crossing the wing at the apex of the discal cell; fourth posterior cell wide open.

Female bears a general resemblance to the male, but the abdomen is a uniform orange-red, with incisions darkened, and without any sign of the silvery tomentum of the male, and the colouring of the posterior legs is lighter.

This species can be distinguished from all the other Australian members of the genus by the bright orange-red scutellum, in conjunction with the orange-red abdomen, the latter being covered in the male by a silvery tomentum. The antennæ are remarkably long, and in their form closely approach those of the genus *Phycus*; the other characters, however, show plainly that the species belongs to the genus *Ectinorrhynchus.*

E. phyciformis has been taken by Mr. Hardy at Hobart and at Wedge Bay during December and January. It has also been taken by Mr. Spry in Victoria in November.

23. LONCHORHYNCHUS, Gen. nov. (Fig. 18).

Black species, having the proboscis projecting prominently forwards; the wings short and narrow, with the fourth posterior cell closed.

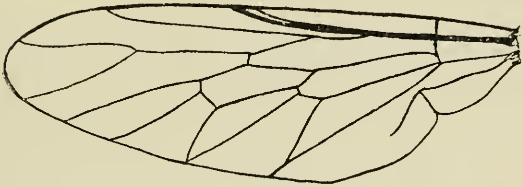

Fig. 18. Wing of *Lonchorhynchus nitidifrons.*

This genus is proposed for three Tasmanian species which seem to form a natural group. It agrees with *Ectinorrhynchus* in having the proboscis projecting prominently forwards, though differing in length in the different species, but differs from that genus in having the wings small and narrow, instead of large and broad, in the closed fourth posterior cell, and in the uniform black colouration with white abdominal markings. The abdomen is long in two of the species, short in the third. The fourth posterior cell is always closed, a character that will at once distinguish the genus from both *Anabarrhynchus* and *Psilocephala*, in which it is always open. From *Parapsilocephala* it is distinguished by the projecting proboscis, more robust build, and characteristic abdominal markings. From the Australian genus *Spatulipalpa, Kröb.*, to which it seems to bear some resemblance, it is distinguished by the small palpi, projecting proboscis, and small wings.

Head broader than the thorax. Front either bare or moderately hairy. Proboscis projecting prominently forwards, usually shorter, but in one species longer, than the antennæ. Palpi small, differing in shape in each species, but usually somewhat spoon-shaped, with a long handle, and sharply angulated about the middle, the two joints being usually bent at almost right angles to one another. Antennæ either about the same length or shorter than the head; the first joint about three times the length of the second, the third expanded and about the length of the first and second together, usually terminated by a minute pointed style. Eyes separated in both sexes. Thorax considerably longer than broad. Abdomen long or short, the colouring always black with white markings; male genitalia differing much in size in the different species. Legs rather short. Wings small and narrow, either hyaline or with indistinct blackish clouding; fourth posterior cell always closed.

Table of the Tasmanian Species of Lonchorhynchus.

1. Tibiæ largely orange; abdomen short. SEGNIS, Sp. nov.
Tibiæ black or brown; abdomen long. 2
2. Femora entirely black; wings without a stigma. NITIDIFRONS, Macq.
Femora black above, red beneath; wings with a conspicuous black stigma. ACTUOSUS, Sp. nov.

LONCHORHYNCHUS NITIDIFRONS, Macq. (Figs. 18 and 19).

Syn. *Anabarrhynchus nitidifrons*, Macq.

Proboscis extending beyond the antennæ; eyes narrowly separated in male, widely in female; thorax brownish-black, with a broad velvet-black median stripe; abdomen long, black, with hindmargins of the second, third, and fourth segments white, the white colour showing no signs of interruption in the centre; femora black; tibiæ brown; wings without any distinct stigma, hyaline in the male, very faintly clouded with black in the female.

Length. Male and female, 10 mm.

Hab. Bagdad Valley, Wedge Bay.

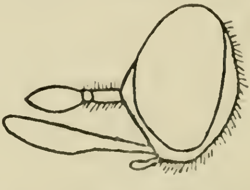

Fig. 19. Head of *Lonchorhynchus nitidifrons.*

Male. Face black. Proboscis large and thick, projecting straight forwards, and extending beyond the tips of the antennæ. Palpi small, very widely separated, not more than one-quarter the length of the proboscis, terminal joint spoon-shaped. Antennæ black, about the length of the head, the first two joints small, the first more than twice the length of the second, the third longer than the first two joints together, expanded in the middle and tapering to a very minute sharply-pointed style. Eyes bare, separated but not very widely. Front black, smooth and shining. Thorax brownish-black, with a broad velvet black median stripe reaching to the scutellum, with which it is of equal breadth; scutellum velvet black, with four black terminal bristles. Abdomen long and tapering, deep black, the last segment and genitalia brownish-black, the second, third, and fourth segments with white hindmargins, the whole covered with short white and black hairs, the white predominating; genitalia long and slender. Legs with femora black, tibiæ brown with black bristles, the knees yellow-brown, those of the anterior pair being the lightest; tarsi dark brown, the first joint pale at the base. Wings hyaline, without any distinct stigma, veins black, the fourth posterior cell closed near to, the anal cell far from, the wing margin.

Female resembles the male very closely, but the eyes are more widely separated, and the wings very faintly clouded with black across the centre.

This species shows little variation, but I have one female in which the white hindmargins of the abdominal segments are very faintly marked, that of the third segment being wanting, and the legs are a much lighter brown than usual.

L. nitidifrons can only be confused with the species next to be described—*L. actuosus*—from which it may be distinguished by the hyaline, or almost hyaline, wings, by the wholly black femora, by the uninterrupted hindmargins to the second, third, and fourth abdominal segments, by the contrasted colouring of the thorax, and by the longer proboscis.

L. nitidifrons occurs sparingly in the bush in the neighbourhood of the Bagdad Valley, and has also been taken by Mr. Hardy at Wedge Bay. It may be found settled on tree trunks or on the ground. My dates range from January 31 to February 15.

LONCHORHYNCHUS ACTUOSUS, Sp. nov. (Fig. 20).

Head much produced in front; thorax black, indistinctly striped; abdomen long, black, the hindmargins of the second, third, and fourth segments white, interrupted with black in the centre; femora black above, red beneath; tibiæ dark red or reddish-black; wings clouded with black across the centre and bearing a conspicuous black stigma.

Length. Male, 10.5-11 mm.; female, 11.5 mm.

Hab. Bagdad Valley.

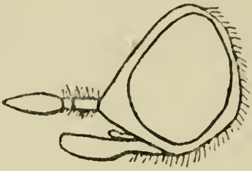

Fig. 20. Head of *Lonchorhynchus actuosus.*

Male. Head much produced in front, with long white pubescence beneath; face black. Proboscis large and thick, projecting straight forwards, reaching as far as the second joint of the antennæ. Palpi small, black, spoon-shaped. Antennæ black, a little shorter than the head; the first joint about three times the length of the second, the third about the same length as the first and second together, expanded in the middle, and tapering to a very minute sharply-pointed style. Eyes bare, more widely separated than in *L. nitidifrons.* Front black, very broad, wrinkled where it approaches the antennæ, and bearing black pubescence. Thorax black, indistinctly striped and mottled with grey, and bearing short black pubescence in front and a little short white pubescence behind; scutellum black, with two long black terminal bristles. Abdomen long, black, nearly parallel-sided, with hindmargins of second, third, and fourth segments white, interrupted with black in the centre, the whole bearing sparse white pubescence; genitalia long and slender. Legs with the femora black above, red beneath, the anterior pair with a short, and posterior pair with a long, black stripe on the under side; tibiæ dark red or reddish-black above, red beneath; tarsi black, with basal half of first joint red; tibiæ with black bristles. Wings clouded with black across the centre, darkest round the discal cell, and with a conspicuous black stigma; base and tips of wings clear.

Female resembles the male very closely, but the eyes are slightly more separated, the front browner, the abdomen more pointed, the legs rather lighter, and the anterior femora with an isolated black spot below; colouring of abdomen and wings as in the male.

This species shows some variation in the black clouding of the wings, which, though always present, is darker and more extensive in some specimens than in others.

L. actuosus can be easily distinguished from *L. nitidifrons* by the clouded wings with a prominent stigma, by the femora being red beneath, the interrupted hindmargins to the second, third, and fourth abdominal segments, the broader abdomen, the uniform colouring of the thorax, and the shorter proboscis; from *L. segnis* by the longer abdomen, by the femora being red beneath, instead of entirely deep black, and by the tibiæ being reddish-black, instead of extensively orange.

L. actuosus frequents logs in the bush, in which situations the males are by no means uncommon; the flies are very active and quick on the wing. The female is very seldom met with; the only two specimens that I have found were frequenting a small pool in the bed of a dried-up creek in the bush. My dates range from November 15 to March 1.

LONCHORHYNCHUS SEGNIS, Sp. nov.

Thorax black; abdomen short, black, the second, third, and fourth segments with white hindmargins, which are broadly interrupted with black in the centre; femora deep black; tibiæ with basal two-thirds orange, apical third black; wings clouded with brownish-black.

Length. Male, 6-7 mm.

Hab. Bagdad Valley, Bellerive.

Male. Face grey, short. Front black, rugose, long and sloping. Proboscis black, rather short, thicker than the antennæ, and reaching to about the end of the first antennal joint. Palpi grey with white hairs. Antennæ black, the first joint about three times the length of the second, which is extremely small, the third a little longer than the first and second together, expanded in the middle, and apparently terminated by a minute style. Eyes bare and somewhat widely separated. Thorax deep black, bare, with sometimes faint indications of longitudinal lines; scutellum black, with two terminal black bristles. Abdomen bare, short, with a truncate appearance, which is caused by the shortness of the genitalia; the second, third, and fourth segments with a white hindmargin, which is broadly interrupted with black in the centre. Legs with the femora deep black; tibiæ with basal two-thirds orange, apical third black, the whole bearing a few short black bristles; tarsi with basal three-fifths of the first joint orange, remainder black. Wings clouded with blackish-brown, which forms a distinct patch on the outer side of the small cross-vein; stigma indistinct.

Female unknown.

Some variation is shown in the colour of the wings, which, though usually clouded extensively with blackish-brown, are occasionally almost hyaline.

This species bears a close resemblance to *L. aetuosus*, but may be distinguished by the shorter abdomen, wholly black femora, and black and orange tibiæ. The male occurs fairly commonly settled on the ground in sandy places, but the female is unknown. The former occurs principally in the spring and early summer, my dates ranging from October 2 to January 4, but I have once met with it in the autumn as late as April 14.

24. ANABARRHYNCHUS, Macq. (Fig. 22).

Robust species, with a broad conical abdomen, eyes widely separated in both sexes, front hairy, and fourth posterior cell of wings wide open.

Head about the same breadth as the thorax. Proboscis usually lying against the face, but sometimes projecting forwards, in which case it is not very long; palpi small. Antennæ about the same length as the head, the first joint about four times the length of the second, the third expanded about the length of the first, and provided with a conspicuous pointed style. Eyes widely separated in both sexes, but more so in the female than in the male. Front hairy, with, usually, a pair of suffused spots. Thorax much longer than broad, usually longitudinally striped; two pairs of prescutellar bristles are almost always present; scutellum with four long marginal bristles. Abdomen conical, longer and more pointed in the female than in the male. Legs stout, of medium length. Wings large and broad, usually tinted with brown or yellow, but absolutely without markings; fourth posterior cell always wide open.

This genus occupies a similar position in the Southern, to that of *Thereva* in the Northern, Hemisphere. Like *Thereva* it contains a number of closely allied species, which are not very easy to distinguish. The principal differences are given in the following table, whilst others will be referred to in the specific descriptions. Considerable assistance will also be afforded by noting the time of year when a species occurred, as only a limited number are on the wing at the same time. Taking the species in the same order as in the following table, the months in which they are known to occur are as follows:—

pallidus	February.
umbratilis	January.
calceatus	October, November.
montanus	January.
helvenacus	November to February.
terrenus	November to March.
passus	October, November.
latifrons	October to February.

Table of the Tasmanian Species of Anabarrhynchus.

1. Anterior femora yellow. 2
   Anterior femora brown. 3
   Anterior femora with basal half black, apical half yellow. 4
   Anterior femora black. 5
2. A sand-coloured species frequenting sandhills on the coast. Pallidus, Sp. nov.
3. Tibiæ olive; wings hyaline. Umbratilis, Sp. nov.
4. Wings hyaline; eyes very widely separated. Calceatus, Schin.
   Wings yellow; eyes not widely separated; a mountain species. Montanus, Sp. nov.
5. Thorax black. 6
6. Front with upper two-thirds black, lower third white. Latifrons, Macq.
   Thorax brown. 7
7. Wings yellow; tibiæ clear yellow; small species. Helvenacus, Sp. nov.
   Wings brownish; tibiæ dark yellow, yellow-brown, or red-brown; larger species. Terrenus, Sp. nov.
   Costa of wings inflated (See Fig. 23); tibiæ yellow. Passus, Sp. nov.

Anabarrhynchus pallidus, Sp. nov. (Fig. 21).

A light-coloured species frequenting sandhills on the coast. Front light yellow-brown, with two deep black spots; thorax yellow-brown; abdomen pale grey; legs yellow; wings hyaline, with light yellow-brown veins.

Length. Male, 8.5 mm.; female, 9.5 mm.

Hab. Bellerive.

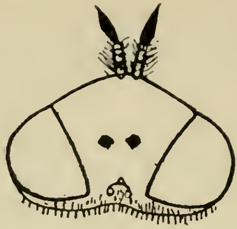

Fig. 21. Front of *Anabarrhynchus pallidus.*

Male. Head produced in front; face grey, receding. Front light yellow-brown, with two sharply-defined black spots, which are situated midway between the eyes and the frontal suture, the whole bearing short pubescence. Proboscis projecting prominently forwards, more so than in any other species of *Anabarrhynchus.* Antennæ with first ioint grey-brown, quite grey at the base, and bearing long black hairs; second joint brown, third black. Eyes very widely separated. Thorax yellow-brown, with traces of three darker brown longitudinal stripes. Abdomen a uniform light grey, bearing short white depressed pubescence. Femora, tibiæ, and tarsi yellow, the tips of the tarsal joints darkened; the femora with a few, the tibiæ with many, black bristles. Wings hyaline, the veins light yellow-brown, the fourth posterior cell slightly contracted towards the wing margin.

Female resembles the male very closely, the eyes being only a little more widely separated, the antennæ rather browner, and the abdomen a trifle more pointed.

A. pallidus is a somewhat aberrant species, differing from the other members of the genus in the less hairy front and the projecting proboscis. The light colouring and two sharply-defined frontal spots make identification easy. It frequents sandhills near the coast, in which situations its colouring is clearly protective. It occurs during February, but seems to be scarce.

ANABARRHYNCHUS UMBRATILIS, Sp. nov.

A medium-sized, robust species, distinguished by the light yellow-brown femora and olive tibiæ. Front with lower third light grey, upper two-thirds brown, with two dark brown suffused spots; thorax brown, with five longitudinal brown stripes; abdomen black; wings hyaline.

Length. Female, 10 mm.

Hab. Wedge Bay.

Female. Face light grey. Front with lower third light grey, upper two-thirds brown, the whole bearing black pubescence. Proboscis black, lying close against the face. Antennæ with first joint grey, with black hairs, second and third black. Thorax brown, with five black longitudinal stripes, the middle and two outer ones being the most distinct. Abdomen black, with hindmargins of segments, except the first, narrowly white. Legs with all the femora a very light yellow-brown, the anterior pair with a black streak above; tibiæ olive, with long black bristles; tarsi black, but base of first joint similarly coloured to the tibiæ. Wings hyaline, bright and glistening, the veins dark brown, but not very prominently marked.

This species bears a close general resemblance to several others occurring in Tasmania, but may be distinguished from all of these by the light brown femora and olive tibiæ.

A. umbratilis is only known from two specimens, which were taken by Mr. Hardy at Wedge Bay in January, 1914.

ANABARRHYNCHUS CALCEATUS, Schin. (Fig. 22).

A large, robust species. Thorax brown or grey-brown, with three brown stripes; abdomen black, dusted with grey on each side; anterior femora with basal half or two-thirds black, remaining portion, and all the middle and posterior femora, reddish-yellow; tibiæ reddish-yellow; wings hyaline with veins yellow-brown.

Length. Male, 9.5-11 mm.; female, 10-13 mm.

Hab. Tasmania. (Also recorded from New South Wales and New Zealand.)

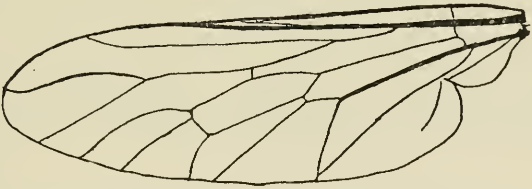

Fig. 22. Wing of *Anabarrhynchus calceatus.*

Male. Face bare, white or grey. Front varying in colour from drab to grey-black, with a pair of brown spots touching the eye on either side, the whole covered with long and dense black hairs. Proboscis black, short and thick, extending a little further than the base of the antennæ. Palpi grey, with long white hairs. Antennæ with the first joint swollen, grey, with long black hairs, about four times the length of the second; second and third joints black, the former very small, the latter expanded at the base, and tapering towards the apex, where it is terminated by a short style, the length being about equal to that of the first joint. Thorax brown, with three dark brown longitudinal stripes, the middle one narrow and always distinct, the outer ones broader and sometimes indistinct. Abdomen black, dusted at the sides, base, and apex with grey, the whole covered with white pubescence, which is short on dorsum, and long on sides; when viewed from the side the second segment has a broad white border. Legs with the middle and posterior femora and all tibiæ reddish-yellow; anterior femora with the basal half or two-thirds, or occasionally the whole, black, remaining portion reddish-yellow; tarsi black, the base of first joint yellow; the tibiæ bear long and abundant black bristles. Wings hyaline, with conspicuous yellow-brown veins, and a small and ill-defined yellow stigma.

Female resembles the male very closely, but the abdomen is longer and more pointed, and when viewed laterally the second to seventh segments have a white hind-margin. The colouring of the front varies from chestnut-brown to black; thorax, abdomen, legs, and wings as in the male.

The colouring of this species is subject to considerable variation. I possess a male which has the thorax pale blue-grey, instead of the usual brown. Most specimens seem to vary in the colouring of the front; indeed for purposes of identification the colouring of the front, thorax, and abdomen can be altogether ignored, the only characters of importance being the colouring of the legs and the widely-separated eyes.

A. calceatus is the commonest Tasmanian species of *Anabarrhynchus*; it occurs in the springtime. It is usually met with settled on the ground in sandy places, and when disturbed flies on a little distance and then settles again; it may also be found settled on the leaves of young gum trees. My dates range from October 4 to November 16.

ANABARRHYNCHUS MONTANUS, Sp. nov.

This species resembles *A. calceatus* very closely, but is distinguished by having the eyes less widely separated in both sexes, and by the yellower wings.

Length. Male, 10 mm.; female, 13 mm.

Hab. Mangalore.

Male. Head small, and less wide in proportion than in

A. calceatus. Face bare, grey. Front grey, with a pair of diffused brown spots touching the eye on either side, vertex brown, the whole bearing long black hairs. Proboscis brownish-black. Palpi brown. Antennæ with the first joint swollen, grey, with long black hairs; second and third black, the former very small, the latter expanded at the base and tapering towards the apex, where it is terminated by a short style. Thorax brown, with five indistinct dark brown longitudinal stripes, the spaces between the three middle lines being dark drab-brown, bounded outside by light yellow-brown. Abdomen black, the sides with white and a little brown pubescence; the second segment when viewed laterally has a white margin. Legs yellow with the exception of the anterior femora, which have rather more than the basal half black; tarsi with basal half of first joint yellow, remainder black; the tibiæ bear numerous long black bristles. Wings tinged with yellow; veins yellow, except towards the tip, where they are brown.

Female resembles the male, but has the front light yellow-brown, the abdomen very long, and when viewed laterally each segment with a white hindmargin, and the wings distinctly yellow.

This species resembles *A. calceatus* very closely, though it is of somewhat more slender build; it may, however, be distinguished without much difficulty by the narrower front, with more closely approximated eyes in both sexes, and by the yellower wings. When the date of capture is known its identification should be easy, for, so far as is known, it does not appear on the wing until some time after *A. calceatus* is over.

A. montanus occurs very sparingly on rocky ground, near the highest part of the hills that bound the Bagdad Valley on its eastern side. Time of occurrence, January.

ANABARRHYNCHUS LATIFRONS, Macq.

A slender black species. Front with upper two-thirds deep shining black, lower third white; thorax and abdomen black; femora black; tibiæ yellow or brown; wings hyaline.

Length. Male, 8 mm.; female, 8-9 mm

Hab. Bagdad Valley, Hobart, Wedge Bay.

Male. Face white. Front with upper two-thirds black, lower third white, the whole bearing black hairs. Proboscis black, lying close against the face. Antennæ black, the first joint with long black hairs. Eyes widely separated. Thorax black, with faint indications of grey stripes.

Abdomen shining black, the second segment with a broad, the third with a narrow, white hindmargin. Legs with femora black; tibiæ brown, with black bristles, the apex black; tarsi black. Wings hyaline, the fourth posterior cell contracted towards the wing margin.

Female resembles the male very closely, but the abdomen is longer. There is little difference in the separation of the eyes between the two sexes.

Variation. The colouring of the front varies considerably; the upper portion is sometimes dull black instead of shining black, and the coloured portion may occupy only half instead of two-thirds of the front. The tibiæ, though usually brown, are sometimes yellow, and there is also considerable variation in the amount of contraction of the fourth posterior cell; this is the only species in which the latter character is known to vary.

A. latifrons may be readily distinguished from the other Tasmanian species by the black colouration, and the black and white front. It occurs commonly through the whole of the summer season, and may be met with in the bush settled on the ground or on logs. The female seems to be more common than the male. My dates range from October 4 to February 11.

ANABARRHYNCHUS HELVENACUS, Sp. nov.

A small, slender species with yellow wings. Frontal spots indistinct; thorax grey or grey-brown, very indistinctly striped; femora black; tibiæ clear yellow; wings yellow.

Length. Male, 7.5 mm.; female, 9 mm.

Hab. Mangalore.

Male. Face grey. Front grey, with a pair of large, indistinct, much-diffused brown spots, the whole bearing long black pubescence. Proboscis black, lying close against the face. Antennæ with first joint grey, with black hairs, second and third black. Thorax grey, with five very indistinct brown stripes, and short black pubescence. Abdomen black, covered extensively with grey tomentum, particularly at the sides, and bearing a little white pubescence; when viewed from the side the second segment has a broad, and the third a narrow, white hindmargin. Legs with all the femora black, knees and tibiæ clear yellow, with the extreme apex of tibiæ black, the whole bearing black bristles; tarsi with first joint yellow at the base, remainder black. Wings yellow, the veins, which do not stand out so prominently as in most species of *Anabarrhynchus*, pale yellow-brown.

Female resembles the male very closely. Eyes not very widely separated. Thorax grey-brown. Abdomen long, the second and third, and sometimes also the fourth, segment with a white hindmargin, the dorsum less covered with grey tomentum than in the male. Legs and wings as in the male.

This species is distinguished from the other members of the genus with wholly black femora, by its yellow wings in conjunction with its small size and slender shape; the only other known Tasmanian species with yellow wings is *A. montanus*, a large mountain species with the middle and hind femora wholly, and the front femora partly, yellow.

A. helvenacus seems to show a fondness for the neighbourhood of water, although it is not altogether confined to such localities. I have found specimens of the female frequenting a small marsh. The species occurs somewhat sparingly, during the summer months, my dates ranging from November 15 to February 11.

ANABARRHYNCHUS TERRENUS, Sp. nov.

A rather large species with brownish wings. Thorax light yellow-brown or grey, with three dark brown stripes, abdomen black, with hindmargins and lower corners of segments white; femora black, frequently reddish towards the apex; tibiæ yellow, yellow-brown, or red-brown; wings brownish.

Length. Male, 8.5-10.5 mm.; female, 10-12 mm.

Hab. Bagdad Valley, Bellerive, Wedge Bay.

Male. Face light grey. Front brown, with black hairs, the frontal spots indistinct. Proboscis black, usually lying close against the face. Antennæ with first joint grey, bearing black hairs, second and third black. Eyes separated, but not very widely. Thorax light yellow-brown, with three chocolate-brown stripes. Abdomen black, with hindmargins and lower corners of second, third, and fourth segments, and almost all the fifth segment, white, the white portions being covered with short depressed white pubescence. Legs with femora black, frequently becoming reddish towards the apex, and sometimes also reddish beneath; tibiæ yellow-brown or red-brown; tarsi black. Wings brownish.

Female resembles the male, but the abdomen is longer, and the eyes rather more widely separated.

Variation. This species is subject to considerable variation, the specimens occurring near the coast being smaller than those found in the bush inland, and having the thoracic stripes more distinctly marked, and the wings frequently paler. These may possibly represent distinct species, but I am unable to find any satisfactory distinction between them. The femora may be entirely black, or else may have the apex reddish.

The only other known Tasmanian species with black femora are *A. helvenacus*, *A. passus*, and *A. latifrons*. From the first of these *A. terrenus* is distinguished by having the wings brownish instead of yellow, by the larger size, the more robust build, and the darker tibiæ; from *A. passus* by the costal margin of the wings being without any conspicuous dilatation; and from *A. latifrons* by the brown instead of black thorax, and the brown instead of black and white front.

A. terrenus occurs somewhat commonly on the sandhills at Bellerive, also somewhat more sparingly in the bush in inland districts. My dates range from November 22 to March 13.

ANABARRHYNCHUS PASSUS, Sp. nov. (Fig. 23).

A medium-sized robust species, distinguished by the shape of the wings. Costa of wings conspicuously inflated; frontal spots wanting; thorax grey-brown, indistinctly striped; abdomen black, with hindmargins of second, third, and fourth segments, and the whole of fifth and sixth segments, white (♂) or yellowish-white (♀); femora entirely black; tibiæ yellow, with apex black.

Length. Male, 8.5 mm.; female, 9.5-10.5 mm.

Hab. Bagdad Valley.

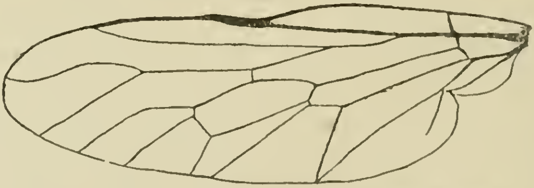

Fig. 23. Wing of *Anabarrhynchus passus*.

Male. Face yellowish-white. Front brown, or grey above and brown below, either altogether without, or with faint indications of, frontal spots, the whole covered with long black hairs. Antennæ with first joint grey, bearing black hairs, second and third black. Thorax light grey-brown, with three indistinct pale brown centre stripes; prescutellar bristles wanting. Abdomen with first segment brown, second, third, and fourth black with broad white hindmargins, which are expanded at the sides; fifth and sixth white; genitalia large, black. Legs with femora entirely black; tibiæ yellow, with black bristles, the apex and tarsi black. Wings with the costa conspicuously inflated from the base to the stigma, which latter is more distinctly marked than in most species of the genus; the wings are either hyaline, or have the veins slightly suffused with brown; veins brown.

Female resembles the male very closely, and only differs in the more widely-separated eyes, and the longer abdomen.

This species may be easily distinguished by the shape of the wings; most species of *Anabarrhynchus* have the costa slightly inflated, but in *A. passus* the inflation is conspicuous. This feature is common to both sexes. Another unique feature that this species presents is the absence of the prescutellar bristles, which are present in all the other Tasmanian species.

A. passus is a spring species. The only other member of the genus on the wing at the same time is *A. calceatus*, from which it may be distinguished at once by the black femora, *A. calceatus* having the anterior femora partly, and the middle and hind femora wholly, yellow.

A. passus occurs somewhat sparingly; it may be found either settled on the ground in sandy places, or else frequenting stones in the beds of mountain streams. My dates range from October 25 to November 9.

In addition to the foregoing species *Anabarrhynchus rufipes, Macq.*, is doubtfully Tasmanian. It is described as having the thorax grey, with three black stripes; abdomen black with incisions and sides white; femora and tibiæ yellow; wings tinged with yellow. If it occurs in Tasmania it should be easy to recognize by the yellow femora and black-striped thorax.

25. PSILOCEPHALA, Zett. (Fig. 24).

Slender species, having the front bare, eyes joined in male, widely separated in female, and wings with the fourth posterior cell—in Australian species—always open.

Head as broad as, or a little broader than, the thorax; front bare. Proboscis usually lying close against the face. Antennæ short, the first joint about three times the length of the second, but shorter than the third. Eyes joined in the male, but widely separated in the female. Thorax bare, but with the thoracic bristles well developed, the dorso-central being either complete or consisting of from one to three pairs of prescutellar bristles. Abdomen narrow, conical in the male, but greatly lengthened in the female; genitalia of the male extended and conspicuous. Legs slender, of medium length, the tibiæ bearing short bristles. Wings either without markings or spotted or banded; the fourth posterior cell—in Australian species—always open.

This genus is distinguished from Anabarrhynchus in both sexes by the much more slender shape and the bare front, and, in the male, by the joined eyes and extended genitalia.

The species that I have placed here are not altogether a homogeneous group, but as they all agree with the characterisation of the genus given above, it seems unnecessary to divide them. The most aberrant species—*P. saxatilis*—which is distinguished by the furrowed eyes, might possibly be made the type of a new genus. The venation of von Kröber's genus *Belonalys* is very similar to that of *Psilocephala lutea* and *P. occulta*, and the genus may belong here.

Table of the Tasmanian Species of Psilocephala.

1. Eyes without furrows. 2
   Eyes with furrows. 5
2. Wings absolutely without markings. 3
   Wings with black markings. 4
3. Antennæ black; thoracic stripes black; a large grey and black species. Nudifemorata, Macq.
   Antennæ orange; thoracic stripes light brown; a large orange-brown species. Lutea, Sp. nov.
   Antennæ orange; thoracic stripes grey; very small species, with silvery tomentum in the male. Nitens, Sp. nov.
4. Abdomen black-brown, with seventh and eighth segments orange; legs yellow. Venusta, Erichs.
   Abdomen entirely black-brown; legs black and brown. Occulta, Sp. nov.
5. Thorax covered with small brown spots; wings spotted. Saxatilis, Sp. nov.

Of the above species *P. nudifemorata* and *P. venusta* are unknown to me, and for their distinguishing characters I rely on the published descriptions.

Psilocephala nudifemorata, Macq.

Syn. *Therera nudifemorata*, Macq.

This species is described by Macquart as having the antennæ black; front white anteriorly, brown posteriorly; thorax yellowish-grey with black stripes; abdomen grey, with black transverse spots; legs red; wings yellowish.

Length. Female, 4 1/3 lines.

This species, described by Macquart under the name *Thereva nudifemorata*, is unknown to me; von Kröber states that it belongs to the genus *Psilocephala*, and I place it here on his authority; the genus *Thereva* does not occur in Australasia.

PSILOCEPHALA LUTEA, Sp. nov. (Fig. 24).

Front light brown; thorax light brown with three brown stripes; abdomen, orange-brown — in life bright orange — each segment with a large dark brown spot, but if the spots are unusually large and confluent, the abdomen then appears dark brown with an orange-brown border; legs yellow; wings light brown, entirely without markings.

Length. Female, 8-9.5 mm.

Hab. Bagdad Valley.

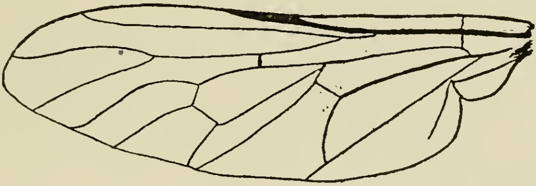

Fig. 24. Wing of *Psilocephala lutea.*

Female. Eyes widely separated. Proboscis and palpi dull orange, both concealed within the mouth aperture. Face small, the antennæ being situated towards the lower part of the head, pale yellow-brown, with a dark brown stripe joining the eyes to the base of the antennæ. Antennæ with first joint somewhat swollen, light brown with black bristles, the second and third joints orange, the second being very small, the third expanded and about the length of the first, and terminated by a black style. Front broad, the lower third pale whitish-brown, bounded above by two short brown stripes, which represent the frontal spots of *Anabarrhynchus;* upper two-thirds brown. Thorax light brown, with three somewhat indistinct longitudinal brown lines; the dorso-central bristles only developed posteriorly, where they are represented by three pairs of long black prescutellar bristles; scutellum grey-brown, with two terminal black bristles. Abdomen in life bright orange, in dried specimens orange-brown, each segment with a large dark brown spot, which occupies all the segment except the side and hindmargins, but these spots may sometimes be so extensive as to occupy almost all the dorsum, or, on the other hand, those on the first and second segments may be much reduced; the dorsum bare, with scattered black hairs along the sides; under side of abdomen orange-brown, with segmentations of anterior segments white. Legs orange-brown, the femora with a few, the tibiæ with many, black bristles; tarsi darkened towards the tips. Wings light brown, entirely without markings.

This species, judging from Macquart's description, seems to be allied to his *P. nudifemorata*, but may be distinguished by the antennæ being orange instead of black, by the thoracic stripes being light brown instead of black, and by the abdomen being orange-brown instead of grey.

P. lutea as a rule occurs very sparingly. It may be met with frequenting small pools in the bush, settled on bracken, or, occasionally, on windows. The male is unknown. My dates range from October 4 to December 19.

PSILOCEPHALA NITENS, Sp. nov.

An extremely small species. Antennæ orange, very short; thorax light grey, with two darker grey stripes; abdomen grey, covered, in the male, with silvery tomentum; legs light brown; wings tinged with brown.

Length. Male, 5 mm.

Hab. Hobart.

Male. Head chiefly occupied by the large eyes, which join for a short distance in the middle of the front. Face white, the mouth aperture large. Proboscis orange, lying close against the face. Antennæ extremely short, the first and second joints particularly so, the third a little longer than the first and second together. Thorax light grey, with two darker grey stripes, one on each side of the middle, and dark grey mottlings towards the sides; dorsocentral bristles complete and well-defined; scutellum dark grey with a silvery border and two black terminal bristles. Abdomen grey, completely covered with silvery tomentum, and bearing soft white pubescence; genitalia very large, orange, with black pubescence. Legs light brown, the hind femora with a suffused black stripe above; apex of tibiæ and tips of tarsal joints black. Wings with a brown tinge, but altogether without markings.

This species is quite distinct; it may be readily recognized by its small size, grey colouration, silvery tomentum of the male, and thorax with two complete rows of dorso-central bristles.

P. nitens is only known from a single specimen taken by Mr. G. H. Hardy at Hobart, on November 30, 1913.

PSILOCEPHALA VENUSTA, Erichs.

Syn. *Thereva venusta,* Erichs.

Female. Front dull, black. Antennæ bright orange, with black bristles. Face black, dusted with grey. Mouth opening and proboscis very large, the latter brownish. Palpi bright yellow-brown. Thorax black; scutellum black, with a broad dark yellow border. Abdomen shining black-brown; first segment dull, seventh and eighth shining orange. Legs bright yellow, second to fifth tarsal joints brown; femora with black pubescence; tibiæ and tarsi with black bristles. Wings hyaline, with a brown band across the small cross-vein, and brown tips.

Length. Female, 10 mm.

Hab. Tasmania.

The above particulars are taken from von Kröber's description, the species being unknown to me. It should be readily recognizable from the black front, and dark abdomen with the seventh and eighth segments orange.

PSILOCEPHALA OCCULTA, Sp. nov.

Antennæ, front, and thorax black; the thorax with two pale grey stripes; abdomen dark brown; femora dark brown; tibiæ brown; wings faintly mottled with black, and with a narrow black stigma.

Length. Female, 8 mm.

Hab. Bagdad.

Female. Eyes separated, but not so widely as in *P. lutea*, fringed behind with white hairs. Proboscis and palpi black, the former more prominent than in the other Tasmanian species, and reaching slightly in front of the face; the palpi rather shorter than the proboscis. Antennæ black, all joints very small. Front bare, black, narrower above than below, the vertex fringed behind with short black hairs. Thorax black, with two narrow pale grey stripes; dorso-central bristles represented by two or three pairs of black prescutellar bristles. Abdomen dark brown. Legs with femora dark brown, tibiæ a lighter brown, with short black bristles, tarsi brown. Wings small, mottled indistinctly with black, and with a narrow black stigma;

fourth posterior cell wide open; anal cell closed well above the wing margin; discal cell small, pointed posteriorly. (The venation of this species is almost the same as that of von Kröber's genus *Belonalys*.)

P. occulta may be distinguished from *P. venusta*, by having the abdomen a uniform dark brown, instead of having the seventh and eighth segments orange; from all the other Tasmanian species by the black thorax with two pale grey stripes, and by the black front. It is possible, however, that it may be confused with the species of the genus *Lonchorrhynchus*, to which it bears some resemblance, but from these it may be at once distinguished by the open fourth posterior cell.

P. occulta is only known from a single specimen taken by myself at Brown's Caves, Bagdad; it was settled on a stone in a small gully, the date of capture being November 9, 1914.

PSILOCEPHALA SAXATILIS, Sp. nov.

Eyes joined in male, but very widely separated in female, in both sexes with a deep furrow. Front in male chiefly occupied with the eyes, in female light brown, extensively spotted and mottled with dark brown; thorax light brown with dark longitudinal stripes, which are broken up into numerous spots and dots; abdomen dark brown, bordered along the sides with yellow; legs light brown; wings tinged and faintly mottled with brown (♂) or brown and distinctly mottled with dark brown (♀).

Length. Male, 6 mm.; female, 8 mm.

Hab. Bagdad Valley.

Male. Head chiefly occupied by the large eyes, which are joined from the vertex to about the middle of the front; the eyes are divided into two portions by a furrow that runs parallel with the antennæ. Face grey. Proboscis dark orange, almost concealed within the mouth aperture. Antennæ much shorter than the head, the first joint light brown, bearing black hairs, about three times the length of the second, the second and third orange, the latter expanded, a little longer than the first, and terminated by a short black style. Thorax light brown, covered with dark brown spots and dots arranged in lines; in the middle is a narrow uninterrupted line, on each side of this a broad line broken up into large detached spots, outside these on each side a row of numerous small dots, and outside these again on each side two irregular rows of larger spots and dots, the whole bearing black pubescence; there is only one pair of prescutellar bristles; scutellum light brown, with small dark brown dots, and bearing two terminal black bristles. Abdomen shining dark brown, with the sides and genitalia brownish-yellow; sides with white pubescence, genitalia with longer black hairs. Legs light brown, with apex of tibiæ and tips of tarsal joints dark brown; tibiæ with black bristles. Wings short and narrow, tinged with brown, and with indistinct spots, the position of which is more easily made out in the female, and will be referred to under that sex; discal cell much narrowed towards the base; fourth posterior cell open, but narrowed towards the margin; anal cell closed at some distance above the margin.

Female differs considerably in appearance from the male; the eyes are very widely separated, and the abdomen long, narrow, and pointed; front light brown, extensively mottled with dark brown dots; colouring of thorax and abdomen as in the male, but the abdominal segmentations are light brown, and more distinctly marked; wings brown, with diffused dark brown spots, the largest covering the apex of the discal cell, a second the apex of the second basal cell, and a third the apex of the anal cell, with a small detached spot within the cell itself; the first basal cell is mostly occupied by a brown smudge, and there is also an indistinct clouding towards the tip of the wing, crossing the cubital fork.

This species may be easily distinguished from the other members of the genus by its brown colouring, small mottled wings, and eyes with cross-furrows. It is not a typical *Psilocephala*, and when more Australian species are available for comparison, it may be necessary to place it in a distinct genus. In the character of the furrowed eyes it agrees with von Kröber's genus *Acatopygia*, but it differs from that genus in its other characteristics.

P. saxatilis is probably a mountain species. Only two specimens are known, which were taken by myself on the highest part of the hills that bound the Bagdad Valley on its eastern side. The female, which was settled on a stone, occurred on January 26, 1912; the male was swept from grass on January 1, 1914.

26. PARAPSILOCEPHALA, Kröber. (Fig. 25).

This genus was proposed by von Kröber for a species from New South Wales and Victoria, which also occurs in Tasmania. Von Kröber distinguished the genus from Psilocephala by the presence of a small yet high arch of the front above the antennæ, and by the third antennal joint being longer than the first and second together, and broader than either of them. In order to determine the validity of these distinctions it is necessary to consider two nearly allied, undescribed species, which undoubtedly belong to the same genus as *P. elegans*, the species described by von Kröber. Neither of these two species, one of which occurs in Victoria and the other in Tasmania, shows any sign of an arching of the front, which would therefore appear to be a specific character only. As to the antennæ, both these species agree with *P. elegans* in having the third joint longer than the first and second together, and broader than either of them, though in neither case is the third joint nearly so large in proportion as in that species. In most of the Australian species of *Psilocephala*, however, the third joint is broader than either the first or second, and if not actually longer than, is frequently about the same length as, the two together; indeed the second species occurring in Tasmania has antennæ hardly differing from those of *Psilocephala*. Under these circumstances some further distinctions are necessary. I would characterize the genus as follows:—Small, delicate, black flies, having the head broader than the thorax, the front bare, the proboscis small and lying close against the lower face; antennæ with the third joint longer than the first and second together, and broader than either of them; eyes joined or closely approximated in the male, widely separated in the female; abdomen long and slender; wings hyaline or crossed by distinct black bands, the fourth posterior cell always closed.

Taking the genus in this sense, it may be distinguished from *Psilocephala* by the closed fourth posterior cell, the cell being usually closed at a considerable distance above the wing margin; from *Lonchorhynchus* by the small proboscis lying close against the face, the smaller size, more slender shape, and by the markings of the wings, if present, taking the form of clearly-defined black bands.

I think it doubtful, judging from von Kröber's description, whether his genus *Oldenbergia* is really distinct from *Parapsilocephala*. Also his genus *Pseudoloxocera*, which is not recognizable from his description, may possibly belong here.

The species of *Parapsilocephala* are widely distributed through New South Wales, Victoria, South Australia, and Tasmania. They may be swept from long grass, and are often common where they occur.

Table of the Tasmanian Species of Parapsilocephala.

Femora pale orange; wings in female hyaline. ELEGANS, Kröber.

Femora black; wings in female with two black bands. BIFASCIATA, Sp. nov.

PARAPSILOCEPHALA ELEGANS, Kröber.

Antennæ with the third joint twice the length of the first and second together, eyes narrowly separated in male, widely in female; thorax greyish-black, with two or three indistinct grey stripes; abdomen brownish-black, the sides orange in the male, segmentations white; legs pale orange, with apices of tibiæ, apical third of first tarsal joint, and all the remaining tarsal joints, black; wings hyaline, veins light.

Length. Male, 5-6 mm.; female, 6.5 mm.

Hab. Bagdad Valley, Brighton (also in New South Wales, Victoria, and South Australia).

Male. Face white; .front shining black, with a small arch directly above the antennæ. Proboscis and palpi orange, both concealed within the mouth aperture. Antennæ (in Tasmanian specimens) dark orange; the first and second joints small, the first about twice as long as the second, the third much enlarged, about twice the length of the first and second together. Eyes narrowly separated. Thorax greyish-black, with three grey stripes or traces of them, the two outer ones being the most distinct; there are two pairs of prescutellar bristles; scutellum shining black, with two terminal black bristles. Abdomen brownish-black, with the sides orange, the amount of orange being subject to considerable variation, the whole bearing short, white, depressed pubescence; second to fourth segments with a white hindmargin, that of the fourth being very narrow; genitalia large, orange. Legs pale orange, knees brown; apex of tibiæ, apical third of first joint of tarsi, and all the remaining tarsal joints, black. Wings small, hyaline, mediastinal, subcostal, and radial veins yellow, remaining veins pale brown.

Female has abdomen considerably longer than the male, which makes the wings appear remarkably small and short; the eyes are widely separated, the front black and shining; abdomen brown at base, becoming gradually black towards the apex, and only mere traces of the orange side margins of the male are visible; legs and wings as in the male.

This species is easily distinguished from *P. bifasciata* by the larger antennæ, and orange instead of black femora, also, in the female, by the wings being hyaline, instead of bearing two black bands.

P. elegans may be found amongst long grass, and is usually common where it occurs. My dates range from January 12 to February 1.

PARAPSILOCEPHALA BIFASCIATA, Sp. nov. (Fig. 25).

Antennæ with the third joint but little longer than the first and second together; eyes practically touching in the male, widely separated in the female; thorax shining black, with two grey stripes, which are most distinct in the female; abdomen black, the second, third, and fourth segments with a white hindmargin; femora black; tibiæ brown; wings in male hyaline, with the exception of a faint clouding above the discal cell, in female crossed by two black bands and with the tip blackish.

Length. Male, 5 mm.; female, 6 mm.

Hab. Bagdad Valley.

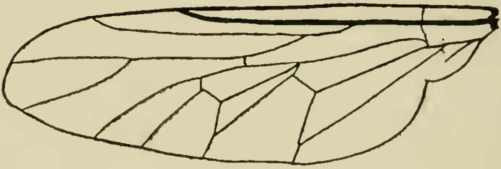

Fig. 25. Wing of *Parapsilocephala bifasciata*.

Male. Face white; front chiefly occupied by the eyes, black, with white tomentum adjoining base of antennæ above. Proboscis and palpi light brown, both concealed within the mouth aperture. Antennæ with first joint whitish, second and third brown; the first joint twice the length of the second, the third slightly longer than the first and second together, and broader than either of them. Eyes practically joined in the middle of the front. Thorax shining black, with two somewhat indistinct light grey stripes; there are two pairs of prescutellar bristles; scutellum black, with two black marginal bristles. Abdomen black, the second, third, and fourth segments with white hindmargins; genitalia black. Legs with the femora black, anterior and middle tibiæ light yellow-brown, posterior tibiæ dark brown, with apices and bristles black; tarsi black, the base of first joint light yellow-brown. Wings hyaline, with a faint clouding directly above the outer half of the discal cell.

Female. Owing to the banding of the wings, this sex differs so much in appearance from the male that it might be easily mistaken for a distinct species. One of these bands crosses the three basal cells, the other crosses the outer parts of the discal and fourth posterior cells; the wing-tips are also clouded with black. The colouring of the body and legs resembles that of the male, but the eyes are widely separated, the front broad, black, and shining, and the two basal segments of the abdomen are often brown; on the under surface of the abdomen the first segment is transparent yellow, the second amber, and remaining segments black.

This species may be easily distinguished from *P. elegans* by the smaller antennæ, the black instead of pale orange femora, and, in the female, by the wings being crossed by two black bands, instead of being altogether hyaline. In a nearly allied, undescribed, Victorian species the wings of the female are crossed by three black bands.

P. bifasciata occurs both settled on the ground, and amongst long grass. My dates range from October 1 to January 12.

Doubtful Species.

The following five species have also been described from Tasmania:—*Thereva hebes, Walk.*, *T. hyalipennis, Macq.*, *T. quinquevittata, Macq.*, *T. varians, Walk.*, and *T. varipes, Macq.* *Thereva* is a genus that does not occur in the Australasian Region, and the species are probably unrecognizable.

Systematic List of the Species described in this Paper.

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NOTES ON THE GENUS PELECORHYNCHUS.

By G. H. Hardy.

(Received 14th September. Read 11th October Issued separately 16th November, 1915.)

During December, 1914, and January, 1915, I procured three species of this interesting and rare genus *Pelecorhynchus.* Two of them are already recorded from Tasmania; the third is new to Tasmania.

P. eristaloides Walk.

1 male specimen from Geeveston, 24 Dec., '14.

I took this specimen, evidently newly emerged, crawling lazily on rocky ground.

P. nigripennis Ricardo.

1 male specimen from Ranelagh, 24 Jan., '15.

Sent to me by Mrs. Lucas, of Ranelagh, and captured in the same manner as *eristaloides.*

P. fusconiger Walk.

1 female, and 2 male specimens, from Wynyard, 21 Jan., '15.

Moderately plentiful in this locality, but hard to catch; visits flowers. I did not see it elsewhere on the North-West Coast.

The specimens seem to agree in every respect with Miss Ricardo's description of the species, with the exception of a few minor details, upon the strength of which it would be unsafe to establish a new species. Possibly a comparison with specimens from the mainland would show this to be distinct.

LIST OF THE TENISON WOODS TYPES OF RECENT MOLLUSCA IN THE TASMANIAN MUSEUM.

By G. H. Hardy.

(Received 28th August. Read 13th September. Issued separately, 25th November, 1915.)

Until recently all types of the Tenison Woods Marine Mollusca were included in the general collections of Tasmanian shells in the Museum, and in consequence some were lost and others broken.

The fresh-water shells were in a drawer in the Curator's office, mixed with much miscellaneous material, and in a very dilapidated condition.

Very few specimens were marked type in Tenison Woods' handwriting (specimens so marked are recorded as such), the majority being marked by a committee of Conchologists formed for the purpose, particulars of which are given in the paper by Mr. W. L. May, Proc. Roy. Soc. Tasm. 1902. Unless otherwise stated, specimens in this list are marked "type."

Since the revision of the types in 1902, some of the specimens have been either lost or broken. Lost specimens are not included in the list. Broken specimens are recorded as such.

The Tenison Woods' fresh-water shells have mostly, if not all, sunk into synonomy, and there is room for considerable investigation on the Tasmanian fresh-water shells, as nothing apparently has been done since Tenison Woods' time.

One fact brought to light may be worth recording: *Turritella atkinsoni*, Tate and May, is taken from a manuscript specimen of Tenison Woods. When describing this the authors did not have Tenison Woods' specimen to consult, so they described it from another specimen, intending the Tenison Woods specimen in the Museum collection to be the type. Apparently no special care was taken of the specimen actually described.

The type of *Natica polita* is amongst the fossil shells, and apparently no recent shell was included in the Tenison Woods collection.

Cerithiopsis albosutura is represented by two specimens in the general collection, neither of which conforms in size to the Tenison Woods description, but they may have belonged to the original Tenison Woods collection.

Siphonaria denticulata var tasmanica was changed later to *S. zonata*.

Three shells in the general collection are named *Natica* (*Mamilla*) *globosa*, T.-W.; these may have belonged to the Tenison Woods collection, but they do not conform to the size given for *Ruma globosa* in the description.

Clathurella sculpturior; a reference is given under the name *Mangelia delicatura*.

Thirty-six other species and five varieties are still missing.

Species that bear manuscript names that were not used for description are also included in the list.

I am greatly indebted to Mr. W. L. May for help in settling many difficulties that I met with while gathering together the Tenison Woods type shells, and also in revising this list.

acuta	Turritella (T.M. 5421) 3 specimens slightly broken.
acuticostata	Terebra (T.M. 5356) 2 specimens, M.S. name.
agnewi	Drillia (T.M. 5361) label marked type by Tenison Woods, with the generic name Pleurotoma. 1 specimen.
,,	Rissoa (T.M. 5486c) 1 specimen.
alba	Acmaea (T.M. 5594) 2 specimens type?
albolirata	Cominella (T.M. 5254) 1 specimen marked type by Ten.-Woods.
allporti	Marginella (T.M. 5328) 3 specimens.
,,	Zizyphinus (T.M. 5535) 1 specimen.
aloysii	Clanculus (T.M. 5560) 2 specimens.
alternata	Mangelia (C. 347) 2 specimens, probably type but not so marked.
angasi	Turbonilla (T.M. 5434) 2 specimens.
angeli	Clanculus (T.M. 5564) 1 specimen.
,,	Rissoa (T.M. 5478) 4 specimens on card, of inferior condition.
annulata	Liotia (T.M. 5506) specimen lost, card marked type by Ten.-Woods.
apheles	Eulima (C. 348) 1 specimen marked type by Ten.-Woods.

assisi	Trophon (T.M. 5244) 1 specimen remounted.
atkinsoni	Cardita (T.M. 5712) 3 specimens. No Ten.-Woods mount or label with this.
,,	Cylichna (T.M. 5615) 2 specimens.
,,	Drillia (T.M. 5367) 1 specimen. Generic name Pleurotoma in Census.
,,	Kellia (T.M. 5717) 3 specimens.
,,	Mangelia (T.M. 5350) 5 specimens.
,,	Rissoa (Cingula) (T.M. 5483) 6 specimens.
,,	Scissurella (T.M. 5571) 3 specimens, one of which is crushed. Generic name Schismope in Census.
,,	Turritella (T.M. 5420) M.S. name, subsequently used by Tate and May (T.R. S.S. Austr. 1900, pg. 95), for this species, but described from another specimen. 2 specimens. This species is further labelled, not by Ten.-Woods, as T. tasmaniensis.
aurea	Gibbula (T.M. 5531) 5 specimens remounted. No Ten.-Woods label or mount with it, and not marked type.
australis	Cingulina (T.M. 5447) 2 specimens, one slightly broken.
,,	Diloma (T.M. 5547) missing from box. Generic name Trochus in Census. Ten-Woods label but no mount. Not marked type.
,,	Trophon (T.M. 5245) 1 specimen.
,,	Tugalia. This species is missing, and Mr. May sent me the following note:—"See Census, pg. 44, there is some curious muddle about this, Ten.-Woods gives it first as of Sow. and then proceeds to say he proposes the same name." (I think this is intended to convey the meaning that he proposes to change the name of the wrongly identified T. ossea Gould to T. australis Sow. In this way sense can be made of the whole passage and also no Ten.-Woods type would be expected in his collection.)

badia	Columbella (T.M. 5340) 4 specimens.
bifasciata	Elusa (T.M. 5439) 1 specimen.
,,	Syrnola (T.M. 5445) 3 specimens.
brazieri	Rissoina (Setia) (T.M. 5481) 5 specimens. Generic name Rissoa in Census.
,,	Trophon (T.M. 5243) 4 specimens remounted.
browniana	Cithara (T.M. 5375) 1 specimen. M.S. name.
bulimoides	Fossarus (T.M. 5455) 1 specimen.
cancellata	Crossea (T.M. 5416) 2 specimens marked type by Ten.-Woods.
,,	Limopsis (T.M. 5729) name subsequently changed to L. tenisoni. 2 specimens, one of which is a complete bivalve. No Ten.-Woods label or mount with this.
carmeli	Conus (T.M. 5380) 1 specimen.
castanea	Siphonalia (T.M. 5243) 1 specimen.
chapmani	Patella (T.M. 5600) 1 specimen.
cheilostoma	Rissoa (Alvania?) (T.M. 5484) 1 specimen.
ciliata	Physa (C. 359) 4 specimens, probably type but not so marked, one slightly broken.
clarkei	Siphonaria (T.M. 5278) 3 specimens.
clathratus	Trophon (T.M. 5242) 5 specimens. Marked T. petterdi Cross on card.
concatenata	Rissoina (T.M. 5550) 1 specimen crushed.
crassus	Mytilus (T.M. 5733) 1 specimen, no Ten.-Woods label or mount with this.
crucis	Acmaea (T.M. 5593) 4 specimens, type? Mr. May informs me that a specimen of this in the Sydney (Australian?) Museum is marked type.
cuculata	Turbo (T.M. 5519) 1 specimen marked type by Ten.-Woods.
cyclostoma	Rissoa (T.M. 5475) 2 specimens.
,, var. rosea	,, (T.M. 5476) 2 specimens.
cypraeoides	Marginella (T.M. 5329) 1 specimen marked type by Ten.-Woods, specific name cypraeformis on card.

delicatula	Phasianella (T.M. 5518) There is a card labelled Phasianella in Ten.-Woods' handwriting; possibly this is the type specimen, but requires authenticating. Not marked type; 2 specimens.
,,	Mangelia (C. 398) 1 specimen found together with Josepha tasmanica; Fusus spicei; Columbella xavierana; Clathurella granulossima. A list with them contained all the above names except the last, also Clathurella sculptulior was contained on the list, and was missing in the group. Undoubtedly this group had been sent to Beddome for examination, and when returned they were never replaced in the collection.
desalesii	Mangelia (T.M. 5373) 2 specimens.
dictua	Columbella (T.M. 5345) 2 specimens marked type by Ten.-Woods.
dolorosa	Gibbula (T.M. 5532) 1 specimen. Generic name Thalotia given in Census.
dominicana	Clanculus (T.M. 5558) 1 specimen.
dulvertonensis	Bythinia (C. 364) 1 specimen, marked type (in Ten.-Woods' handwriting?).
,,	Pisidium (C. 372) 1 specimen, probably type, but not so marked.
dunrobinensis	Bythinia (C. 367) specimen missing, card probably held type, but not so marked.
dyeriana	Auricula (Rhodostoma) (T.M. 5621) 2 specimens; species name dyerana in Census.
epitrema	Ranella (T.M. 5269a) 1 specimen, no Ten.-Woods label or mount with this.
fasciata	Rissoa (Alvania) (T.M. 5485) 5 specimens; not marked type.
flindersii	Rissoina (T.M. 5486a) 3 specimens.
franciscana	Mitra (T.M. 5313) 1 specimen.
gertrudis	Rissoina (T.M. 5486b) 2 specimens, type?
goldsteini	Trophon (T.M. 5241) 2 specimens, no Ten.-Woods mount or label with this.
granulifera	Turritella (T.M. 5419) 3 specimens.

granulosissima	Clathurella (C. 399) 1 specimen, see note under Mangelia delicatula; probably type, but not so marked.
hisseyiana	Littorina (T.M. 5480) 7 specimens, labelled by Ten.-Woods on card hisseyana.
hobartiensis	Limnea (C. 353) 5 specimens. The specific name is credited to Cox on card in Ten.-Woods' handwriting; I think it will prove to be the type of Ten.-Woods species. Not marked type.
huonensis	Bythinia (C. 365) 16 specimens, probably type but not so marked. Subsequently made type of genus Tatea (T.-W.).
,,	Limnea (C. 352) specimens smashed, card only; probably held type, but not so marked.
,,	Physa (C. 357) 1 specimen badly broken, the card probably held type, but not so marked.
immaculata	Dosinia (T.M. 5693) 4 specimens, only one complete bivalve; no Tenison Woods label or mount with this.
,,	Mangelia (Drillia) (T.M. 5374) 1 specimen.
incerta	Liotia (T.M. 5502) 2 specimens in inferior condition.
incrusta	Drillia (T.M. 5363) 2 specimens, genus Pleurotoma in Census.
josephi	Cyclostrema (T.M. 5509) 2 specimens.
labiata	Crossea (T.M. 5414) 3 specimens.
latus var.	Mytilus (T.M. 5730) type? requires authenticating; the label with this specimen bears the name M. latus var tasmanicus T.W., but as it is only 61mm. long it cannot be the type of that species. In the Census Mylitus tasmanicus is given as 19cm. long. No measurements are given with M. latus nov. var.? Proc. Roy. Soc. Tasm. 1876, pg. 157; inside the shell is the number "51" possibly in Ten.-Woods' handwriting. The label is not by Ten.-Woods.

lauretanea	Clanculus, an M.S. name (T.M. 5565) 2 specimens. This is marked type, not by Tenison Woods, but apparently it has not been described under that name.
legrandi	Bythinia (C. 361) 7 specimens, probably type but not so marked.
,, small var.	Bythinia (C. 362) 27 specimens. I have found no reference to this var., not marked type. (Note.—The name of this species was subsequently changed to Bythinella exigua, later it was sunk, like many other fresh water shells, into synonomy.)
legrandi	Columbella (T.M. 5349) 1 specimen.
,,	Fusus (T.M. 5273) 1 specimen.
,,	Mitra (T.M. 5319) 3 specimens; a fourth specimen on the card is marked "another."
,,	Physa (C. 358) 1 specimen, probably type but not so marked.
,,	Zizyphinus (T.M. 5536) 1 specimen.
littorinoides	Purpura (T.M. 5252) 1 specimen.
macleayana	Venus (Chione) (T.M. 5675) 1 specimen type? no Ten.-Woods mount or label with this.
,,	Conus. See Conus tasmanicus.
,,	Turbonilla (T.M. 5435) 2 specimens.
marginata	Eulima (C. 349) 1 specimen marked type by Tenison Woods.
marmorata	Acmaea (T.M. 5595) 2 specimens, type? no Ten.-Woods mount or label with this.
mariae	Pecten (T.M. 5749) 1 specimen, half bivalve, no Ten.-Woods label or mount with this.
,,	Rissoa (Cingula) (T.M. 5482) 4 specimens, two of which are broken.
,,	Tellina (T.M. 5670) 3 specimens, no Ten.-Woods mount or label with this.
,,	Turbonilla (T.M. 5436) 3 specimens, one of which is broken.

melanura	Rissoa (T.M. 5477) 3 specimens.
meredithiae	Mangelia (T.M. 5377) 7 specimens, not marked type.
micans	Eulima (T.M. 5429) 1 specimen.
michaeli	Syrnola (T.M. 5444) 1 specimen.
micra	Cyclostrema (T.M. 5511) 1 specimen crushed not marked type.
miltostoma	Columbella (T.M. 5344) 1 specimen.
minima	Lucina (T.M. 5700) 1 type specimen and one other; no Ten.-Woods label or mount with this.
minimum	Bittium (T.M. 5466) 1 specimen marked type by Ten.-Woods.
minuta	Ampullarina (T.M. 5629) 3 specimens.
,,	Columbella (T.M. 5348) 5 specimens.
,,	Drillia (T.M. 5359) 2 specimens, generic name Pleurotoma in the Census.
,,	Nucula (T.M. 5723) 3 specimens.
minutissima	Marginella (T.M. 5327) 1 specimen.
,,	Rissoina (T.M. 5486d) 1 specimen marked type by Ten.-Woods.
multicarinata	Gibula (T.M. 5566) 1 specimen.
nana	Natica (T.M. 5397) 1 specimen requires authenticating; it is on a Ten.-Woods mount. The Ten.-Woods label is missing and is not marked type.
petterdi	Acmaea (T.M. 5589) 1 specimen.
philipineri	Pleurotoma (T.M. 5357) 2 specimens.
philomena	Clathurella (T.M. 5365) 2 specimens. In the Census this is named Pleurotoma philomenae.
philomenae	Clanculus (T.M. 5559) 1 specimen, named in the Census philomena.
pontvillensis	Bythinia (C. 363) about 38 specimens, probably type, but not so marked.
propinqua	Purpura (T.M. 5253) 1 specimen.
pulchella	Phasianella = delicatula, see note under that name.
pulchra	Siphonalia (T.M. 5366) 1 specimen.
punctata	Diala (T.M. 5456) 2 specimens.

punctata-striata	Rissoa (Ceratia) (T.M. 5448) 1 specimen, marked type by Ten.-Woods.
raphaeli	Clanculus (T.M. 5561) 2 specimens.
reticulata	Venerupis (T.M. 5695) 4 specimens, generic name Rupellaria given in Census; no Ten.-Woods label or mount with this.
roblini	Columbella (T.M. 5338) 6 specimens.
rosea	Monilea (T.M. 5523) 3 specimens.
scalariformis	Mitra (T.M. 5317) 2 specimens.
scita	,, (T.M. 5318) 3 specimens.
siennae	Rissoa (Setia) (T.M. 5496) 6 specimens, three of which are evidently of recent addition. This species is subsequently recorded as synonymous with Assiminea tasmanica (T.W.); the note in Proc. Roy. Soc. Tasm. 1879, pg. 70, evidently does not mean that the two descriptions were taken from the same specimen.
simsoni	Turbo (Lunella) (T.M. 5522) 2 specimens.
spicei	Fusus (T.M. 5275) 1 specimen.
,,	,, (C. 396) 1 specimen, probably cotype. See note under Mangelia delicatula. Neither of these specimens conforms to the dimensions in the description.
squamosissima	Trophon (T.M. 5244) 2 specimens, marked type by Ten.-Woods; they have evidently been remounted.
stanislas	Marginella (T.M. 5326) 2 specimens.
St. Clarae	Rissoina (T.M. 5458) 1 specimen.
St. Gallae	Mangelia (T.M. 5372) 1 specimen.
susonis	Cyclostrema (T.M. 5510) card only, specimen lost, not marked type.
taeniata	Drillia (T.M. 5360) 1 specimen, marked type by Ten.-Woods.
tasmanica	Aplysia (T.M. 5620) 1 specimen in inferior condition.
,,	Assiminea (C. 369) 1 specimen, probably type but not so marked. See note under Rissoa sienna.

tasmanica	Bythinia (C. 368) 3 specimens, probably type but not so marked.
,,	Cancelleria (T.M. 5353) 1 specimen, corrected to Cancellaria in Census.
,,	Cominella (T.M. 5287) 3 specimens, no Ten.-Woods mount or label with this.
,,	Cithara (T.M. 5371) 1 specimen. Genus name Cythara in Census.
,,	Daphnella (T.M. 5369) type specimen broken, and one other specimen which Mr. May informs me Miss Lodder put there.
,,	Diplodonta (T.M. 5706) 1 specimen, type? This specimen does not bear a Ten.-Woods label or mount. The generic name on the label is Mysia.
,,	Eulima (T.M. 5428) 1 specimen.
,,	Gasterochaena (T.M. 5626) 1 specimen.
,,	Gouldia (T.M. 5690) 1 specimen broken.
,,	Josephia (C. 395) 1 specimen, probably type, but not so marked. See note under Mangelia delicatula.
,,	Liotia (T.M. 5499) 2 specimens one of which is broken.
,,	Macrochisma (T.M. 5581) 3 specimens, which do not conform to the Ten.-Woods type measurement, but undoubtedly belonged to the Ten.-Woods collection. Not marked type.
,,	Marginella (T.M. 5322) 1 specimen.
,,	Margarita (T.M. 5526) 1 specimen, under genus Minolia in the Census.
,,	Mitra (T.M. 5316) 4 specimens on card, they have probably been remounted. One specimen is indicated type, one as var. A., and a third as var. B.
,,	Myodora (T.M. 5647) 2 specimens, no Ten.-Woods label or mount with this.

tasmanica		Mytilicardia (T.M. 5715) 4 specimens, no Ten.-Woods label or mount with this.
,,		Nassa (T.M. 5294) 3 specimens.
,,		Natica (T.M. 5396) 2 specimens, which do not conform to the Type measurements, but undoubtedly belonged to the Ten.-Woods collection. Not marked type.
,,		Neaera (T.M. 5644) 5 specimens, half bivalves, only one of which is not broken.
,,		Odontostoma (T.M. 5440) 1 specimen.
,,		Parthenia (T.M. 5443) 3 specimens.
,,		Physa (C. 354) 4 specimens, only one of which is perfect; probably type but not so marked.
,,	var. A	Physa (C. 356) 1 specimen, probably type but not so marked. This is the Clyde var.
,,	var. B	Physa (C. 355) 5 specimens, probably type but not so marked. This is the Cole River var.
,,		Pisania (T.M. 5284) 2 specimens.
,,		Pythinia (T.M. 5707) 7 specimens, half bivalves only; the specimens, probably remounted, do not bear a Ten.-Woods label; the generic name is given as Mylitta.
,,		Stylifer (C. 346) 2 specimens.
,,		Styloptygma (T.M. 5431) 1 specimen.
,,		Triforis (T.M. 5467) 3 specimens, one of which is broken.
,,	var.	Triforis (T.M. 5468) 1 specimen broken, listed in Census as "var a."
,,		Tugalia (T.M. 5586). Two small specimens mounted on a card with T. ossea in Ten.-Woods' handwriting, and one large specimen of which Mr. May says:—"is undoubtedly the type of T. tasmanica." Not marked type.
,,		Turbonilla (T.M. 5437) 2 specimens.

tasmanica	Valvata (T.M. 5493) 3 specimens. No Ten.-Woods mount or label with this; the label contains the following:—"Amnicola? Beddomeia tasmanica (T.W.) (as Valvata) types? Tasmania." Mr. May informs me that the description is printed on a slip and pasted? in the Proc. Roy. Soc. Tasm. 1875, page 82. immediately below Cyclas tasmanica where there is a vacant space. This is missing in the copy in the Royal Society's Library, nor have I seen the description elsewhere.
tasmanicola	Physa (C. 360) 2 specimens, probably type but not so marked.
tasmanicum	Pisidium (C. 371) about 40 specimens, probably type but not so marked.
tasmanicus	Ancylus (C. 351) 10 specimens, probably type but not so marked.
,,	Conus (T.M. 5381) 1 specimen, specific name subsequently changed to macleayana.
,,	Euchelus (T.M. 5552) 1 specimen.
,,	Fossarus (T.M. 5551) 2 specimens crushed, specific name tasmanica on card.
,,	Planorbis (C. 570) 21 specimens, probably type but not so marked.
tenisoni	Limopsis, see Limopsis cancellata.
tenuicostata	Cominella (T.M. 5289) 2 specimens.
teresiae	Mitra (T.M. 5315) 5 specimens.
tessellata	Diala (T.M. 5457) 4 specimens.
tristriata	Aclis (T.M. 5446) 2 specimens, one slightly broken.
tumida	Diala (T.M. 5486) 2 specimens.
turboniloides	Bittium (C. 350) 2 specimens, marked type by Ten.-Woods; Mr. May points out that they represent two distinct species, they will therefore require authenticating.

turrita	Siphonaria (T.M. 5279) 2 specimens.
umbilicatus	Trophon (T.M. 5238) 2 specimens.
unicarinata	Bythinia (C. 366) 3 specimens, probably type but not so marked.
unilirata	Rissoina (T.M. 5486e) 1 specimen broken, marked type by Ten.-Woods; Generic name Rissonia on Card.
varix	Daphnella (T.M. 5368) 2 specimens.
victoriae	Callista (T.M. 5689) 1 specimen, no Ten.-Woods label or mount with this.
warburtoni	Semele (T.M. 5663) 1 specimen, no Ten.-Woods label or mount with this.
weldiana	Dentalium (T.M. 5634) 1 specimen.
,,	Drillia (C. 414) 1 specimen; not marked type, but undoubtedly the specimen from which the description is taken.
weldii	Cyclostrema (T.M. 5512) 3 specimens crushed, not marked type.
,,	Gibbula (T.M. 5527) 1 specimen.
,,	Macrochisma, name proposed for M. tasmanica, which see.
,,	Mitra (T.M. 5314) 3 specimens.
,,	Tenagodus (T.M. 5426) 1 specimen.
xavierana	Columbella (T.M. 5342) 1 specimen; this does not conform to the type measurements, but probably formed part of the Ten.-Woods collection. Not marked type.
,,	Columbella (C. 397) 1 specimen, probably cotype but not so marked; see note under Mangelia delicatula.
zonata	Siphonaria (T.M. 5631) very doubtful if these are part of the Ten.-Woods collection, 2 specimens, without Ten.-Woods mount or label. Not marked type.
zonatus	Murex (Pterontus) (T.M. 5235) 2 specimens, remounted, one marked type, Flinders Island.

PSEUDOPEZIZA CASUARINAE. Sp. Nov.

L. Rodway, Gov. Botanist.

(Read 9th August, Issued separately 20th November, 1915.)

Subcutaneous but soon bursting through the epidermis and forming a small cushion bearing numerous conidia (Gloeosporium). Subsequently the pulvinus expanding, asci are formed, and the formation of conidia ceases.

Mature pulvinus oblong 0·5 - 1 mm. in long diameter, dark red-brown, of a tough fleshy consistency. Conidia hyaline, broadly oblong. Asci cylindric, 8 spored, spores broadly oblong with very obtuse ends, hyaline 17 x 8 μ. Paraphyses filiform.

On ultimate branchlets of *Casuarina distyla, Vent.* Above Waterworks, Hobart.

The conidial stage is found in Spring and early Summer, the ascigerous form in Winter. It appears to exercise very little injurious effect upon the host. The branchlets yellowing and falling earlier in the affected instances.

ADDITIONS TO THE TASMANIAN MARINE MOLLUSCA, WITH DESCRIPTIONS OF NEW SPECIES.

By W. L. May.

(Issued separately, 31st December, 1915.)

Plates I.-VIII.

A visit by the writer to the Furneaux Group in November, 1912, resulted in the addition of several species to our list,* and careful investigations in Port Arthur and D'Entrecasteaux Channel have largely increased our knowledge of our Chiton fauna, adding new species and extending the distribution of others.

The dredging operations in connection with the two last Easter camps of the Field Naturalists' Club at Safety Cove and Thouin or Wineglass Bay, have also added a number of interesting species. These localities are respectively the most northern and most southern spots at which deep-water dredging has been carried out in Tasmania.

It is proposed in this paper to give a list of the additions, to record certain facts respecting distribution, and to describe 40 species which appear to be new to science. The types of these last will be placed in the Tasmanian Museum collection. Altogether I here add nearly a hundred species to our list. May, 1915.

SEPIA CULTRATA, Hoyle.

Chall. Report XVI., p. 136, Pl. XX., f. 133.

Common at times in Frederick Henry Bay.

SEPIA APAMA, Gray.

Ceph. Antip. B.M., p. 103, 1849.

Common on beaches at Barren Island.

TROPHON SEGMENTATUS, Verco.

Trans. Royal Soc., S.A., Vol. XXXIII., 1909, p. 335, Pl. XXIV., fig 3.

Several specimens, living and dead, from 50-70 fathoms, off Port Arthur.

DAPHNELLA FENESTRATA, Verco.

Op. cit., page 321, Pl. XXVIII, figs. 6-7.

Several small specimens from off Port Arthur, 50-70 fath., and also Thouin Bay, 40-50 fath.

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* For a complete list of the species taken on that occasion see Victorian Naturalist, Vol. XXX., No. 3.

MARGINELLA DIPLOSTREPTUS, nom. mut.

M. biplicata, Tate and May, T.R.S., S. Aus., 1900.
Non *M. biplicata*, Krauss, 1852.

IMBRICARIA PORPHYRIA, Verco.

Trans. R.S., S. Aus., 1896, p. 227, Pl. VIII., figs. 5-5a.
Off Thouin Bay, 40 fathoms, four specimens.

RETIZAFRA CALVA, Verco.

T.R.S., S. Aus., Vol. XXXIV., 1910, p. 143, P. XXIX., f. 2-3.

Off Thouin Bay, 40 fathoms, fairly numerous. The Clathrate variety mentioned by the author also occurred.

PYRENE JAFFAENSIS, Verco.

Op. cit., Pl. XXIX., figs. 5, 6.

Off Thouin Bay, 40 fath. Our shells are a variety differing from typical, by being finely spirally lirate.

DRILLIA PENTAGONALIS, Verco.

T.R.S., S. Aus., 1896, p. 222, Pl. VII., figs. 2-2a.

40 fath. off Schouten Id., also off Port Arthur, 50-70 fath. This has been united with *D. cancellata*, Beddome, but I consider they are distinct.

CANCELLARIA AUSTRALIS, Sowerby.

Conch., Ill., 1832, fig. 22.

I collected this near Circular Head. It is a fine species, quite distinct from all our other forms.

ADMETE STRICTA, Hedley.

Records, Aus. Mus., Vol VI., pt. 4, p. 295, Pl. LIV., fig. 10.

40 fath. off Schouten Id., also 50-70 fath. off Port Arthur, several examples.

NATICA STICTA, Verco.

T.R.S., S.A., Vol. XXXIII., 1909, p. 333, Pl. XXIX., figs. 4, 5, 6.

40 fath., off Thouin Bay. Three small specimens.

VERMICULARIA WAITEI, Hedley.

Mem. Aus. Mus. (Thetis), Vol. IV., pt. 6, p. 347, fig. 72.
D'Entrecasteaux Channel.

ROYA NUTATA, Hedley.

P.L.S., N.S.W., Vol. XXXIII., p. 9, fig. 15.

East Coast in several places, from 50 to 80 fath. Identified by the author.

ODOSTOMIA SIMPLEX, Angas.

P.Z.S., 1871, p. 15, Pl. I., fig. 10.

D'Entrecasteaux Channel; several specimens dredged in about 10 fathoms. I think this species has been previously recorded as *O. angasi*, Tryon, etc.

LEIOSTRACA KILCUNDÆ, Gatliff and Gabriel.

P.R. Soc., Vic., Vol. XXVII., N.S., 1914, p. 94, Pl. XIV., figs. 2 and 3.

East and South Coasts in about 50 fathoms. Four examples.

EULIMA TOPAZIACA, Hedley.

P.L.S., N.S.W., Vol. XXXIII., p. 470, pl. X., fig. 29.

Three specimens from 24 fathoms, Port Esperance.

EULIMELLA COACTA, Watson.

Chal. Report, p. 498, Pl. XXXIII., fig. 4.

Several specimens from 40 to 60 fathoms in various places on the East Coast. Except that our shells are slightly longer in the mouth, they seem typical.

DIALA PULCHRA, A. Adams.

Ann. Mag. Nat. Hist. (3), X., 1862, p. 296.

Several specimens received some years ago from Miss Lodder, from the N.W. Coast. They are quite typical from comparison with the figure of the type. See P.L. Soc., N.S.W., 1913, Pl. XVIII., f. 57 (C. Hedley). From the same source I am able to say definitely that the identification by Tate of a Tasmanian and S. Australian shell as *D. picta*, A. Ads., is wrong, and the name must pass from our list.

LIPPISTES ZODIACUS, Hedley.

P.L.S., N.S. Wales, Vol. XXXII., pt. 3, 1907, Pl. XVIII., fig. 30.

Numerous in 40 fathoms off Thouin Bay.

LIPPISTES TORCULARIS, Tenison Woods, as *Cingulina*.

P.L.S., N.S.W., II., 1878, p. 263.

About a dozen examples, from 40 fathoms, off Thouin Bay.

CERITHIOPSIS HALLIGANI, Hedley.

Records Aus. Mus. Vol. VI., pt. 2, 1905, p. 51, fig. 16.

40 fathoms, off Thouin Bay; a single specimen.

TRIPHORA INNOTABILIS, Hedley.

P.L. Soc., N.S.W., 1903, part 4, p. 608, Pl. XXXII., figs. 23, 24, 25.

Off Thouin Bay, in 40 fathoms; several examples.

TURRITELLA SOPHIÆ, Brazier.

P.L.S., N.S.W., Vol. VIII, p. 227.

Two specimens collected in the Furneaux Group by the Messrs. Atkinson were shown to me. They are rather beach-worn, but appear to belong to this species.

RISSOA NOVARIENSIS, Frauenfeldt.

Voy. Novara, Moll., p. 11, Pl. II., fig. 16.

Off Thouin Bay, 40 fathoms. Several specimens.

RISSOA WILSONENSIS, Gatliff and Gabriel.

P.R.S., Vic. 26 (N.S.), Pt. I., 1913, p. 68, Pl. VIII., fig. 4.

Numerous in 40 fathoms off Thouin Bay; also 100 fathoms off Cape Pillar; one specimen.

RISSOA IRAVADOIDIS, Gatliff and Gabriel.

Op. cit., p. 67, Pl. VIII., fig. 1.

Several from 40 fathoms, off Thouin Bay.

ONOBA BASSIANA, Hedley.

Its range has been extended by the taking of several spècimens—some living—from 40 fathoms, off Thouin Bay.

CHARISMA ARENACEA, Pritchard and Gatliff (Leptothyra).

P.R.S., Vic., Vol. XIV. (N.S.), part 2, p. 181, Pl. IX, f. 3.

Several from 40 fathoms off Thouin Bay.

CLANCULUS OCHROLEUCUS, Philippi, 1846.

A single specimen collected on Forsyth Id., Furneaux Group.

NOTOACMÆA SUTERI, Iredale.

T.N.Z. Inst., Vol. 47, p. 430 = Acmæa roseoradiata, Suter.

Several specimens from 40 fath. off Thouin Bay. Identified from New Zealand examples.

ISCHNOCHITON DECUSSATUS, Reeve.

Conch. Icon, 1847, Pl. XVIII., f. 107.

Fairly numerous in a rock pool near the half-caste settlement on Barren Id.

ISCHNOCHITON USTULATUS, Reeve.

Op. cit., species 102.

Common with the last. Varies somewhat from South Australian specimens.

CHITON ORUKTUS, Maughan.

T.R.S., S. Aus., 1900, p. 89.

Numerous in Port Arthur, also Wedge Bay and Little Taylor's Bay. It attains a much greater size than in S. Australia, some specimens being upwards of 23 mill. in length.

CHITON AUREOMACULATUS, Bednall and Mathews.

P.M.S., London, Vol. VII., pt. 2, 1906, p. 91, Pl. IX., f. 3.

Three examples collected in Port Arthur by E. Maule I think it possible that this is the young form of C. tricostalis.

LORICA VOLVOX, Reeve.

Conch. Icon., sp. 31.

Furneaux Group, several examples; also Port Arthur, where they are particularly fine; also in Norfolk Bay.

ACANTHOCHITON KIMBERI, Torr.

T.R.S., S. Aus., 1912, Vol. XXXVI., p. 167, Pl. VI., figs. 5a-6.

Several specimens taken in Port Arthur.

ACANTHOCHITON RUBROSTRATUS, Torr.

Op. cit., p. 169, Pl. VII., fig. 7 a-f.

Port Arthur, Wedge Bay, Little Taylor's Bay. Closely resembles A. costatus, Adams and Angas.

LEUCONOPSIS PELLUCIDUS, Cooper.

Micro. Jour., 1 Jan., 1841, p. 16. Types from Van Diemèn's Land.

This is the species wrongly identified as *O. minor*, Mouss., in Tate and May, page 420. Occurs also at Barren Island.

HYDATINA EXIGUA, Hedley.

R.A. Mus., Vol. VIII., p. 158, Pl. XLV., f. 46.

A specimen was collected by Miss Lodder on the North Coast, who wrongly identified it as *Akera tasmanica*, Beddome, under which name it was figured by Hedley, P.L.S., N.S.W., 1901.

DENTALIUM VIRGULA, Hedley.

M.A. Mus., Vol. IV., 1903, p. 338, fig. 62.

A number taken in 50-70 fathoms, off Port Arthur.

CUSPIDARIA ANGASI, Smith.

Chal. Report, p. 47, Pl. IX., fig. 5.

Several examples from 50-70 fathoms, off Port Arthur. Smith's figure represents a young shell. The beak becomes much more prominent as growth proceeds.

CUSPIDARIA BRAZIERI, Smith.

Op. cit., p. 51, Pl. IX., f. 3.

D'Entrecasteaux Channel and off Port Arthur, 50-70 fathoms.

PHOLADOMYA ARENOSA, Hedley.

P.L.S., N.S.W., Vol. XXIX., 1904, p. 197, Pl. IX., f. 26, 27, as *Thraciopsis.*

A fair number of single valves from 40 fathoms, off Thouin Bay.

PHOLADOMYA TASMANICA, Hedley and May.

P. Mal. S., Vol. XI., pt. 11, 1914, p. 132, figs. in text.

50 fathoms, three miles south of Port Arthur. Types.

THRACIOPSIS LINCOLNENSIS, Verco.

T.R.S., S. Aus., 1908, p. 229, Pl. XXVIII., figs. 19, 20, 21.

I find that the species catalogued by Tate and May, page 423, is really referable to this species. It has only been taken in the Derwent Estuary.

MESODESMA NITIDA, Deshayes.

P.Z.S., 1854, p. 338.

North Coast.

CHIONE PERONII, Lamarck.

Anim. S. Vert., Vol. V., p. 606, 1818.

Common on beach at Lady Barron, Flinders Island. Perhaps only a variety of *C. scalarina*, Lamarck.

DOSINIA CROCEA, Deshayes.

B.M. Cat., No. 10, 1853, Type from Flinders Id.

This species has been retaken in the Furneaux Group by the Messrs. Atkinson.

ERYCINA PARVA, Deshayes.

P.Z.S., 1856, 182.

Off Arch Id., two valves; off Thouin Bay, 40 fathoms, one valve.

MONTACUTA DROMANAENSIS, Gatliff and Gabriel.

P.R.S., Vic., 1912, Vol. XXV., p. 167, Pl. IX., figs. 1-4.

Several specimens from Sulphur Creek, near Penguin.

CYAMIOMACTRA COMMUNIS, Hedley.

P.L.S., N.S.W., 1906, Vol. XXX., p. 541, Pl. 31, figs. 11, 13.

North Coast; probably Tamar Heads. Collected by A. Simson.

CUNA PLANILIRATA, Gatliff and Gabriel.

P.R.S., Vic., XXIV. (N.S.), 1911, p. 191, Pl. XLVII., figs. 13-17.

100 fathoms, 7 miles east of Cape Pillar, a fair number occurred. A very similar species—or possibly variety—was found plentifully off Thouin Bay, in 40 fathoms. I think it very doubtful if it is correctly placed in *Cuna*.

PRONUCULA DECOROSA, Hedley.

M.A. Mus., IV., pt. 5, 1902, p. 290, fig. 39.

Several specimens from off Pilot Station, in nine fathoms, seem a variety of this. In our shells the radiating ribs are less pronounced.

Pl. VIII., fig. 42 and 42a.

GLYCIMERIS AUSTRALIS, Quoy and Gaimard.

Voy. Ast. III., 1835, p. 469, Pl. 77, figs. 7-9.

Valves occurred at Forsyth Island, Furneaux Group. Our shells are well represented by Reeve's figure of *P. flammea*, Conch. Icon., Pl. XI., fig. 7, which is possibly distinct from *G. australis*.

ARCOPERNA SCAPHA, Verco.

T.R.S., S.A., Vol. XXXII., 1908, p. 196, Pl. XII., figs. 1-5.

40 fathoms, off Thouin Bay; a few single valves.

MYODORA SUBALBIDA, Gatliff and Gabriel.

P.R.S., Vic., July, 1914, p. 96, Pl. XV., f. 14.

100 fathoms, 7 miles east of Cape Pillar; a single valve.

SOME OBSERVATIONS ON DISTRIBUTION, ETC.

CALLOCHITON INORNATUS, Ten.-Woods.

Until lately this species was only known from our North-West Coast, but it has recently been found in considerable numbers, and of large size, in Port Arthur and D'Entrecasteaux Channel. That so conspicuous a shell should have been so long overlooked is remarkable, the reason being that search was not made into sufficiently deep water. This shell has a very large fleshy girdle, which shrinks on drying to a fraction of its living size.

CALLOCHITON MAYI, Torr.

Several specimens of this remarkable species have been taken in Port Arthur (E. Mawle), and also in 10 fath., off Pilot Station, previously only known from the N.W. Coast.

ACANTHOCHITES VARIABILIS, Ad. and Ang.

This N.W. species has been taken near George's Bay, East Coast (E. Mawle).

CALLISTOCHITON ANTIQUUS, Reeve.

Numerous examples have lately been taken in Port Arthur by Dr. Torr, W. L. May, and E. Mawle.

OLIVELLA NYMPHA, Ad. and Ang.

A specimen was taken near George's Bay, East Coast (E. Mawle).

MACTRA MATHEWSI, Tate.

Was recorded by Tate and May, without locality. I collected valves on Forsyth Island, Furneaux Group.

SEMELE EXIGUA, A. Adams.

Somewhat doubtfully recorded from Tamar Heads by Tate and May. I found it extremely abundant at the settlement, Barren Island.

NATICA SCHOUTANICA, May.

Since describing this species, I have taken a living specimen in 50-70 fath., off Port Arthur. This shows it to have a shelly operculum.

MARGINELLA OVULUM, Sowb.

This species is variable in size and in the crenulation of the lip, some specimens being strongly toothed, others faintly, and others again perfectly smooth. They may vary in length from 9 mill. to 5 mill. Pritchard and Gatliff* have made the var. or form *tenisoni*, Pritchard, a synonym of *M. pisum*, Reeve, but I consider the shells so identified to be only a form of *ovulum*. Last year I sent a number of *M. ovulum* to E. A. Smith, of the British Museum, who replied, 24th June, 1912:—"We fortunately have that species (viz., *ovulum*), and other species described, from Professor Bee's collection (acquired in 1880).

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* Pro. R.S., Vict., 1906, p. 46.

It was described without a locality, but in the Museum we have other specimens from Brisbane, Queensland. All the examples are larger than any you have sent, the type being 8 mill. in length. Your largest is only 6½ mill. None of our shells have any signs of denticulation within the outer lip, which is quite smooth. The form of the shell and basal plicæ are similar in both. The only difference, therefore, is that of size and smoothness, or denticulation of the labrum.

M. pisum, Reeve, is a minute form, 3mill. long, and different in shape. It is shorter, and more globular; plicæ, four in number, and the outer lip is smooth within, not denticulate. The form is quite different to the shells you sent as *M. ovulum*.

It seems to me that your shells should be regarded as a variety of *ovulum*, and not as distinct. The smaller size and denticulation, which is variable, is not enough, I think, to separate them."

I now have Tasmanian specimens quite as large as the type, and, like it, smooth on the lip. It seems to be the most universally distributed species on our continental shelf, being invariably present in dredgings.

TARANIS ACULEATA, N. Sp.

Shell small, broadly fusiform, yellowish brown, whorls five, including a prominent two-whorled protoconch, which is finely spirally lirate. Adult whorls strongly angled about the upper third by a prominent spiral keel, which bears at regular intervals well developed spinose nodules, about 10 on the body whorl; above to the suture the whorl is concavely hollowed, with a finely nodulous keel. Below the carina are two prominent keels, bearing numerous sharp nodules, connected somewhat irregularly above and below, with axial riblets. On the base are about seven keels, the first two slightly nodose, the rest smooth. The three prominent keels give the whorls a square appearance. Aperture rather expanded, canal short and open, columella concave, corrugated by the basal keels, which pass into the shell. Outer lip armed by four spines, alternating large and small; sinus sutural, deep and narrow, bounded on one side by the sutural liræ, and on the other by the finely nodulous keel.

Length 3. Breadth 1.8 mill.

Type from 50 fathoms, off Thouin Bay, with eight others. A very beautiful and distinct little species, with affinities to *T. lamellosa*, Sowb.

Pl. I., fig. 1.

TARANIS MICROSCOPICA, N. Sp.

Shell very minute, yellowish, whorls three and a half, including a one and a half whorled protoconch, which is large, rounded, and spirally lirate. The two adult whorls are strongly angled at the periphery, from whence to the suture they are flat or concave. The sculpture consists of sharp, narrow, axial ribs, about twelve on the body whorl, which extend from suture to suture, and pass into the aperture. They are widely separated, the interspaces being crossed by a few very faint spiral liræ. Aperture rathe expanded, canal very short. Columella excavate, oute lip strongly varixed, sinus at the suture deep and ope and bordered by a varix.

Length 1.3. Breadth 7 mill.

Type from 40 fathoms, off Thouin Bay, with a numbe of others. An extremely minute species, which is allied to *T. excavata*, Gatliff.

Pl. I., fig. 2.

BELA TASMANICA, Sp. Nov.

Shell small, ventricose, white, the front half of the body whorl brownish, whorls three and a half, including a one and a half whorled protoconch, which is spirally lirate. Whorls two, rounded, crossed by strong axial ribs, about nine on the body whorl, they follow each other at the suture, and fade away on the base. These ribs are separated by spaces about twice as wide as themselves, and crossed by numerous flattened liræ, which are close together, and slightly corrugate the ribs. Aperture large, oval, scarcely forming a canal; above it forms a round shallow sinus.

Length 2.6. Breadth 1.5 mill.

Type, D'Entrecasteaux Channel, 10 (?) fathoms. Two others from deep water off Schouten Island.

This is very similar to some of the European species of *Bela*. Possibly it would be as well placed with *Anachis*.

Pl. 1., fig. 3.

CLATHURELLA NODORETE, Sp. Nov.

Shell small, narrowly pyramidal, white, whorls five and a half; the tip is at first smooth, but becomes ribbed and gradually assumes the adult sculpture. Whorls encircled by two prominent keels, one a little below the suture, and the other below the middle of the whorl. There is also a smaller one just visible above the suture. They are crossed by strong ribs of about equal size, ten on the penultimate, and form square meshes. At the points of intersection is a rounded nodule. There are several smaller keels on the base, corrugated by the ribs. Aperture large, narrowed above and below, where there is a short canal. Outer lip strongly dentated by the sculpture, and thickened by one of the axial ribs. Sinus sutural, distinct, surrounded by a raised border.

Length 3.3. Breadth 1.5 mill.

Type, from 80 fath., off Schouten Id.; four others, mostly imperfect, from other places in deep water. Resembles *C. modesta*, Angas, which is much larger, more elongated, with more spirals, and without the nodules.

Pl. I., fig. 4.

VEXILLUM PUMILIO, N. Sp.

Very small, fusiform, yellowish, the central third of the whorls paler. Whorls three, exclusive of a two-whorled, smooth, pointed protoconch, which is brown and polished. Adult whorls strongly ribbed, fourteen on the body whorl, twelve on the penultimate. Aperture rather narrow, especially in front. The columella bears three rather weak plaits.

Length 4.3. Breadth 2 mill.

Habitat—Type, from 40 fathoms, off Thouin Bay, with 20 others, and from several other localities, from 10 to 100 fathoms.

Remarks.—Related to *V. scalariformis*, Ten.-Woods. It is about half the length, has a whorl less, a more elongated protoconch, and narrower aperture, and is in every way a less robust shell. *V. legrandi*, Ten.-Woods, is also a near relative, but is a broader and more solid shell, with a large, rounded protoconch.

Pl. I., fig. 5.

MARGINELLA AURICULATA, Sp. Nov.

Shell very small, pyriform, yellowish white. The spire is quite hidden. Aperture as long as the shell, and rises very much above the summit, giving the shell a lopsided appearance; aperture linea, narrow, expanding at the rounded front. Columella convex, bearing about 6 plaits, of which the first two are much the stronger. The first ascends nearly perpendicularly; the second is very transverse; the remaining four are small, of nearly equal size, and widely spaced. Outer lip much thickened, with a few small tubercles near the middle of its length, on the inside.

Length 1.8. Breadth 1.1 mill.

Type, with 30 others, from 40 fath., off Thouin Bay. A most distinct form, that cannot be mistaken for any other.

Pl. I., fig. 6.

MARGINELLA SUBAURICULATA, Sp. Nov.

Shell minute, smooth, greyish-white, very squat and broad. Whorls about three, the spire minute, but distinct. Last whorl ventricose. Aperture rather narrow, but expanding in front. Columella convex, with six plaits, the basal one very strong and much curved, the remaining five are small, decreasing as they ascend. Outer lip massive, simple, rises above the summit of the shell, curves widely outwards, but with sinuous inward curve as it descends.

Length 1.5. Breadth 1.2 mill.

Type, from 40 fathoms, off Thouin Bay, with a few others. A remarkably obese little species, that seems thoroughly distinct from any other.

Pl. II., fig. 7.

MARGINELLA THOUINENSIS, Sp. Nov.

Shell small, white, semi-transparent, ovate, spire hidden. Aperture narrow above, but widening considerably towards the rounded front. Columella convex, bearing about nine plications, of which the first three are strong. Those above are very much smaller. Outer lip rises above the summit, is strongly thickened, and simple.

Length 2. Breadth 1.4 mill.

Type, from 40 fathoms, off Thouin Bay, with about thirty others. It forms one of a small group in company with *M. pumilio*, Tate and May, and *M. flindersi*, Prit. and Gat., of which *pumilio* is intermediate, and possibly they are all variants of one species.

Pl. II., fig. 8.

MARGINELLA FREYCINETI, Sp. Nov.

Shell very small, white and shining, ovate, narrower in front, spire minute, but distinct, of about two turns. Aperture rather narrow, widening gradually towards the front. Columella slightly convex, and bearing three fairly equal plications. The outer lip rises below the spire, and is only slightly shouldered; it is strongly thickened and simple.

Length 2. Breadth 1.2 mill.

Type, with a number of others, in 40 fathoms, off Thouin Bay, Freycinet Peninsula, also from C. Pillar, 100 fathoms, and other places, including the Furneaux Group. Related to *M. connectans*, May, but is only half the size, less cylindrical, with more spire, and three equal sized plaits.

Pl. II., fig. 9.

MARGINELLA PROCELLA, Sp. Nov.

Shell elongately oval, yellowish-white, with traces of two yellow bands; spire small, of three whorls, partly covered by a callus, which extends from the columella over half the front of the shell, and also considerably behind the outer lip. This is a rare feature amongst our Marginellas. Columella convex, with three moderate sized, strongly ascending plaits, the first two being close together; there is a fourth retreating plication considerably above the others. Outer lip not much thickened, and strongly incurved; it rises above the level of the spire. The aperture is rather narrow.

Length 5.5. Breadth 4.5 mill.

Type, from 24 fathoms, in Storm Bay (whence the name), 40 fathoms, off Schouten Id., four examples. I also have a specimen from Port Jackson. It resembles *M. inconspicua*, Reeve, which, however, has a much more exserted spire, and a finely crenated lip.

Pl. II., fig. 10.

MARGINELLA PRÆTERMISSA, Sp. Nov.

Shell large, solid, fusiform, with a tall spire, colour yellow, deeper on the upper part of the whorl, but with a light band at the suture. Whorls 4½, slightly convex. Apex rather sharp, body whorl sloping above, not shouldered. Numerous low, rounded ribs begin on the last spire whorl, and extend from suture to suture; on the body whorl they fade away before reaching the periphery. Lip somewhat sinuous, strongly thickened; it bends back at the upper attachment, forming a channel, or sinus. Columella concave, bearing four distinct plaits, which become more transverse and stronger as they ascend.

Length 13.5. Breadth 5 mill. But a co-type is 15 mill. long.

Type, with several others, received from Mr. Williamson, of Brown's River, who says he is sure they are Tasmanian, and believes they came from the East Coast. Exact locality uncertain.

Pl. II., fig. 12.

This is a very fine species, being only exceeded in size amongst our Tasmanian members of the genus by *M. muscaria*. It has been overlooked as being a var. of

M. tasmanica, with which species it has much affinity, but differs in the distinct ribbing, the contour of the lip, and the very much greater size. *M. tasmanica* is very constant in size and shape, and always smooth. *M. formicula* is a very much broader shell, with far stronger ribs. *M. georgiana*, May, is much smaller, of a thin, transparent texture, and the ribs do not reach to the suture.

MARGINELLA GEORGIANA, Sp. Nov.

Shell elongate, narrow, with a well developed spire, colour yellowish-white, apex blunt and rounded; whorls 3, hollowed above; smooth at first, but small, wrinkle-like ribs develop and become more prominent on the body whorl; they extend from the shoulder, and fade away before reaching the centre of the body whorl. Aperture narrow above, widening rapidly towards the front; outer lip sinuous, moderately thickened, unarmed Columella excavate, and bearing four ascending plaits, the upper three being much the stronger.

Length 7. Breadth 3.5 mill.

Type, with three others, from 15 fathoms, near George III. Reef, below Southport.

This is a near relative to *M. formicula*, Lamk., but it is much narrower, with a longer spire, much less strongly ribbed, and of a thin, delicate texture. My experience of *M. formicula* shows it to be a strictly littoral species, living between tide marks, whilst this form was from fairly deep water.

Pl. III., fig. 13.

MARGINELLA CADUCOCINCTA, Sp. Nov.

Shell very small, obtusely pyriform, with a moderately elevated sharp spire. White, with three pale chestnut bands. Whorls three; the body whorl very broad-shouldered, gradually decreasing to the narrow base. Aperture narrow above, widening towards the front. Outer lip thick, solid, and smooth. Columella bearing four strong plaits. The first colour band is at the suture, the third at the upper plication, and the other intermediate. They are indistinct, often scarcely discernible, and very frequently the shell is pure white.

Length 3. Breadth 2 mill.

Although considerably resembling several others, I cannot place it with any described species known to me.

Type, with about two hundred others, from 40 fathoms, off Thouin Bay.

Pl. II., fig. 11.

ZAFRA COLUMNARIA, Sp. Nov.

Shell small, elongate, of a graceful tapering form, shining, pale yellowish, with a row of white dots above the centre of the whorl, and larger golden-brown spots scattered irregularly. Whorls five, including a smooth-polished, elongated, swollen protoconch. Adult whorls moderately rounded, strongly axially ribbed, about 16 on the penultimate, they extend right across the whorls, but become evanescent on the base, which has a few faint keels. Aperture elongate, narrowed above and below. Columella callus, spreading somewhat over the base. Outer lip thickened by one of the ribs.

Length 4.5. Breadth 2 mill.

Type, with several fragments, from 100 fathoms, off Cape Pillar; also from 40 fathoms, off Thouin Bay; one small. An elegant little form, which appears to be very rare.

Pl. III., fig. 14.

EULIMA SCHOUTANICA, Sp. Nov.

Shell yellowish-white, highly polished, sharply-pyramidal, recurved, apex minute, nucleus transparent. Whorls 10, slightly rounded, increasing slowly to the body whorl, which is largely developed, suture distinct. Mouth pyriform. Lip rather expanded, and callously thickened on the columella.

Length 3.7. Breadth 1.3 mill.

Type, from 40 fathoms, off Schouten Island. Another, not quite adult, from 50-70 fath., off Port Arthur, and a third from Harrisson's collection, probably from D'Entrecasteaux Channel. Distinguished by its narrow spire, curved in opposite directions, and the swollen body whorl.

Pl. III., fig. 15.

It is distantly related to *E. commensalis*, Tate.

EULIMA COLUMNARIA, Sp. Nov.

Shell yellowish-white, glassy, semi-transparent, narrow, sub-cylindrical, slightly bent near the top. Whorls 8, not much rounded, and slowly increasing, apex mammillated. Mouth broadly pyriform. Lip anteriorily expanded, and reflexed over the base, which is narrowly excavate.

Length 3.4. Breadth 1 mill.

Type, from 50-70 fathoms, off Port Arthur, with six others.

Pl. III., fig. 16 and 16a.

EULIMA MAMILLA, Sp. Nov.

Shell very minute, white, shining, pyramidal. Whorls 4½d, rapidly increasing; apex mammillated; mouth broadly pyriform; lip anteriorly expanded; umbilical area moderately excavated.

Length 1.4. Breadth 0.5 mill.

Type, 50-70 fathoms, off Port Arthur, with one other. Another from 40 fathoms, off Schouten Island. An extremely minute Eulima, but easily recognisable, the swollen apex being a good distinguishing feature.

Pl. III., fig. 17.

EULIMA CUNÆFORMIS, Sp. Nov.

Shell yellowish-white, highly polished, narrowly pyramidal, slightly curved, apex blunt. Whorls 8, slightly rounded, suture distinct, the base of the preceding whorl showing clearly through the shell; body whorl tumidly developed. Mouth small, pyriform, umbilical area broadly excavate.

Length 4. Breadth 1.5 mill.

Type, with one other, from 50 fathoms, off Maria Island. Two, from 50-70 fathoms, off Port Arthur, and four, from 40 fathoms, off Schouten Island. A species without very marked characters, but which I cannot unite with any other known to me. Apex further enlarged.

Pl. III., fig. 18, shell, fig. 18a.

ODOSTOMIA OCCULTIDENS, Sp. Nov.

Shell minute, white, translucent, shining, smooth. Whorls three, plus a prominent heterostrophe pullus. Adult whorls rounded, regularly increasing. Aperture ovately-pyriform. Columella arched, thin, with a minute plication, rather above the centre, which is invisible from a front view.

Length 1.5. Breadth 1 mill.

Type, with several others, from 100 fathoms, 7 miles east of Cape Pillar; also from other localities, from 10 to 50 fathoms. A very variable species in some particulars. The shape is usually fairly constant, although it is some times a little longer than the type, and it scarcely varies in size. It may have no plait at all, or it may be fairly well developed. The pullus may be prominent as figured or quite immersed. I have tried to separate it into two species, but all the forms seem to intergrade.

Pl. IV., fig. 19.

ODOSTOMIA CRASSICOSTA, Sp. Nov.

Shell minute, white, solid, short, truncated, boldly ribbed. Whorls 3, plus a smooth, inverted tip. Whorls rounded; suture deeply impressed, or channeled. About 20 strong rounded axial ribs cross the whorls, and bend over into the suture, and disappear on the base. They are separated by deep furrows of about equal width, which are crossed by numerous slightly raised liræ, which do not pass over the ribs, but continue on the base. Mouth ovately pyriform, slightly expanded in front. Columella curved, a little reflected over a narrow umbilicus, and bearing medially a very small, blunt tooth, which is quite invisible from a front view.

Length 1.7. Breadth 1 mill.

Type, from 50-70 fathoms, off Port Arthur, with several others; from off Schouten Id., one specimen. It has considerable resemblance to *O. oodes*, Watson, Chal. Report, p. 485, from Cape York, but seems a very distinct little species.

Pl. IV., fig. 20.

TRIPHORA OBLIQUA, Sp. Nov.

Shell large, very elongated, rugose, yellowish-brown. Whorls at least 20, flattened, broadest at the lower suture. Sculpture: A prominent rounded, smooth pullus develops two strong keels, which continue on two whorls, and are abruptly succeeded by two rows of gemmules, which after 8 or 9 whorls pass into the final adult sculpture, which consists of three nodular keels, the lower two the strongest; the nodules, and their interspaces, form axial ribs, which, being nearly in a line with the spire at first, become more oblique as they descend, trending towards the right. There is also a well developed sutural keel, which strongly margins the periphery of the body whorl, and there are two smaller ones on the base. Mouth rather square, produced behind into a tubular canal.

Length 17. (?) Breadth 3 mill.

Type, from 50-70 fathoms, off Port Arthur. No perfect specimen of this well-marked species has yet been taken, and the figures are from two examples. The apical portion is well preserved, but the mouth is somewhat imperfect, and the tube may be more produced. This is one of our largest species. The length given is approximate, but from a comparison with several overlapping fragments, is nearly correct. The strong rugose appearance, and particularly the very oblique axial ribs, are very striking, and the apex is also a good specific guide.

Pl. IV., fig. 21, lower portion of shell, fig. 21a, apical portion.

ROYA DEVEXA, Sp. Nov.

Shell small, white, much elevated, with a large, prominent spiral nucleus, which projects far forward over the posterior slope, and consists of three rapidly increasing whorls, smooth and shining. Adult shell smooth, but not shining, lamellated with growth lines, which are strongly developed on the anterior slope; there are faint indications of radial ridges near the base. It is possible the species reaches a much greater size, and that these radials would then develop into regular ribs. The base forms a narrow oval, rather pointed under the apex. There are the remains of a thin deciduous epidermis.

Height 5. Breadth, greatest 4½, least 3 mill.

Type, with five others (all smaller), from 50-70 fathoms, off Port Arthur, and an apical portion from 40 fathoms, off Schouten Island. This remarkable species seems most nearly related to *R. violacea*, Angas.

Pl. IV., fig. 22.

STREPHOPOMA NUCLEOCOSTATA, Sp. Nov.

Adult shell roughly and irregularly involute in the same plane, yellowish, sculptured by numerous lamellar growth lines and periodic mouths. The nucleus is embraced and almost concealed by the first turns of the adult. It is naticoid in form, of about three turns, at first flattened and smooth; axial ribs develop on the last whorl, and become stronger until they reach the lip; mouth ovate, much produced in front. Columella expanded over a small umbilicus. Colour purplish-brown, with a golden shine.

Dimensions of nucleus: Height 1.2. Diameter 1.5 mill. Major diameter of adult about 8 mill.

Type, from Frederick Henry Bay, taken from kelp roots. The nucleus shell is occasionally found in dredgings.

Pl. IV., fig. 23, and Pl. V., fig. 23a.

RISSOA OBELISCUS, Sp. Nov.

Shell small, yellowish white, elongate, narrowly pyramidal, smooth and polished; apex somewhat bluntly cunæform. Whorls 7, slightly convex, broadest near the lower suture, which is well impressed. Mouth roundly oval, columella lip a little expanded over a distinct umbilical chink.

Length 2.2. Breadth 1 mill.

Type, from 50-70 fathoms, off Port Arthur, with four others; and one, from 40 fathoms, off Schouten Island. It considerably resembles *R. scopulorum*, Watson, from the Sandwich Islands. Chal. Report, Pl. XLV., fig. 4.

Pl. V., fig. 24.

RISSOA PUPOIDES, Sp. Nov.

Shell minute, white, shining, cylindrical, apex blunt and rounded. Whorls 5, much rounded, suture deeply impressed. Mouth roundly ovate, pointed above. Columella expanded over an umbilical chink.

Length 1.7. Breadth 0.8 mill.

Type, from 50-70 fathoms, off Port Arthur, with about a dozen others. Remarkable for its pupæform shape and minute size.

Pl. V., fig. 25.

RISSOA SIMILLIMA, Sp. Nov.

Shell very small, bluntly conical, broad, solid, whitish. Whorls 4, rounded, rapidly increasing, apical one glassy and shining, the rest opaque; suture well impressed; body whorl very large. Mouth large, rounded on the outer lip, but rather straight on the columella, producing an angle in front; lip patulus, and reflexed oxer a distinct umbilical crevice. Sculpture: The body whorl is crossed axially by numerous narrow, horny, or translucent bands, which seem as though they might be the intervals between very low riblets, or growth lines, but I have not been able to quite satisfy myself that these spaces are really raised.

Length 1.8. Breadth 1.3 mill.

This is very near to *R. principis*, Watson, Chal. Report, p. 608, Pl. XLIV., f. 13, of which it may be a variety. Our shell is broader, and the mouth more angular. Although not common, it seems to be well distributed on our continental shelf.

Pl. V., fig. 26.

RISSOA MULTILIRATA, Sp. Nov.

Shell elongately pyramidal, white, clouded with a few chestnut blotches. Whorls five, rounded, including a smooth pullus of two rounded whorls. The sculpture consists of flatly rounded keels, separated by narrow grooves, about eight on the penultimate, and ten on the body whorls; base smooth. The first keel, below the well-impressed sutures, is larger than the others, and has a wider groove below it. Aperture roundly pyriform; columella lip expanded, rather produced in front. Outer lip slightly denticulated by the sculpture.

Length 3. Breadth 1.5 mill.

Type, with several others, from Frederick Henry Bay. A variety from C. Pillar has the centre of the whorls smooth. Its nearest ally here, *R. layardi*, Pett., is a smaller, narrower shell, with fewer and stronger keels.

Pl. V., fig. 27.

RISSOA FREYCINETI, Sp. Nov.

Shell minute, white, shining, solid, pyramidal. Whorls four and a half, rounded, including a smooth pullus of two whorls. Adult whorls two and a half, at first with three keels, but others develop, so that there are six to seven on the body whorl. These keels are strong, rounded, and separated by grooves of equal width. Aperture large, ovate, pointed above. Columella lip expanding over the umbilical area. Outer lip rather thick.

Length 1.4. Breadth 8 mill.

Type, with four others, from 40 fathoms, off Thouin Bay, Freycinet Peninsula. I cannot connect this with any known species.

Pl. V., fig. 28.

ALVANIA THOUINENSIS, Sp. Nov.

Shell minute, pure white, elongate, whorls four and a half, including a smooth, shining protoconch of one and a half turns. Adult whorls three, rounded; suture canaliculate; first whorl widest at its lower third, where there is a keel, crossed by narrow axial riblets. These riblets continue on the other whorls, but disappear on the base. On the second whorl about four keels appear, which become stronger and more numerous on the body whorl, where there are about ten, and raise small nodules, where they cross the ribs. Aperture pyriform; columella much rounded; lip somewhat expanded. Outer lip thin and simple.

Length 1.8. Breadth 0.8 mill.

Type, with twelve others, from 40 fathoms, off Thouin Bay. Distinguished by its deeply excavate sutures.

Pl. VI., fig. 29.

ALVANIA SEMINODOSA, Sp. Nov.

Shell small, shining, pale yellowish, the central third of the whorl white, elongate. Whorls five; the protoconch, at first smooth, develops about five faint spirals. Whorls rounded, suture well impressed. The spire whorls bear about nine nodulous-like ribs, which become narrower and weaker as they descend, and almost disappear on the body whorl. There are a few faint spirals on the base. Aperture rather broadly pyriform, oblique, surrounded by a well-defined margin.

Length 2. Breadth 0.9 mill.

Type, with 20 others, from 40 fathoms, off Thouin Bay. A very distinct form. It is remarkable that nearly all the specimens taken have been injured by some predatory mollusc.

Pl. VI., fig. 30.

ALVANIA SUPRASCULPTA, Sp. Nov.

Shell elongate, white or yellowish. Whorls five and a half, rounded, suture well impressed; protoconch, of one and a half turns, smooth. Adult whorls four. The spire whorls bear three spiral keels, about equally spaced. They are crossed by numerous axials of about equal size and distance, forming square meshes, which latter are finely spirally lirate; small nodules are formed by the junction of the keels. On the base of the body whorl are three extra keels. Aperture rounded. Outer lip thickened and scalloped by the keels.

Length 2.4. Breadth 1.1.

Type, from 40 to 50 fathoms, off Thouin Bay, with a number of others. A beautifully sculptured little shell, which appears to be undescribed.

Pl. VI., fig. 31.

AMPHITHALAMUS TRIANGULUS, Sp. Nov.

Shell small, brown, shining, pyramidal. Whorls four, including a smooth, dome-shaped protoconch. The three adult whorls are encircled by two rounded keels, one at the suture and the other at the periphery. The upper one is at first smooth, but develops nodules, which give it a beaded appearance on the body whorl. The lower keel is itself divided by a narrow groove. On the base are three small keels. Aperture roundly-ovate, peristome continuous, pointed above, forming a flattened ring, whilst the opening itself is margined by a narrow, raised thread.

Length 1.5. Breadth 1.

Type, with twenty others, from 40 fathoms, off Thouin Bay.

Pl. VI., fig. 32.

AMPHITHALAMUS AURANTIOCINCTUS, Sp. Nov.

Shell small, narrowly pyramidal, white, with two orange bands. Whorls five, rounded, suture well impressed, faintly axially costate; first three whorls, and base smooth. There is a narrow orange band at the periphery, which just shows above the suture on the spire; a second is on the middle of the base. Aperture roughly quadrangular. Columella straight and upright; behind it an umbilical chink; outer lip sharp; the front lip bends back towards the axis of the shell.

Length 2.5. Breadth 1.4 mill.

Type, with several others, mostly broken, from 40 fathoms, off Thouin Bay. It resembles *A. erratica*, May, which is smaller, of a thinner texture, a rounder mouth, and without the colour bands.

Pl. VI., fig. 33.

AMPHITHALAMUS PERTUMIDUS, Sp. Nov.

Shell minute, white, ovate, smooth. Whorls four, including a rounded pullus, which is inclined to the left. Whorls much rounded, contracting sharply to the impressed suture. The third whorl projects tumidly to the right, beyond the line of the spire. Mouth ovately pyriform, the outer lip forming a segment of a circle; columella lip somewhat expanded, obtusely angled in front.

Length 2.2. Breadth 1 mill.

Type from 40 fathoms, off Thouin Bay, with four others. Also from 100 fathoms, off Cape Pillar, three examples. Co-types are mostly imperfect.

Pl. VI., fig. 34.

AMPHITHALAMUS TIARA, Sp. Nov.

Shell minute, tumid, white, shining, with faint growth lines. Whorls three and a half, very much rounded; suture deeply impressed. The third whorl is much expanded and flattened, giving the shell the appearance of being crowned by a turban. Aperture large, oval, entire; lip expanded, particularly over the front of the columella.

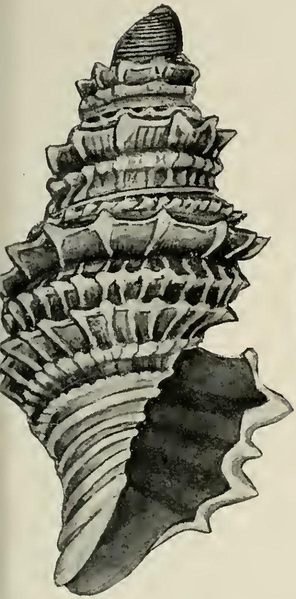
Length 2. Breadth 1 mill.

Type, with three others, from 40 fathoms, off Thouin Bay.

Pl. VII., fig. 35.

EPIGRUS SEMICINCTUS, Sp. Nov.

Shell small, narrowly elongate, smooth, chestnut or yel-



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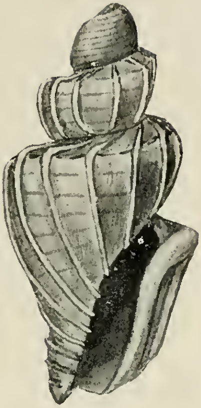

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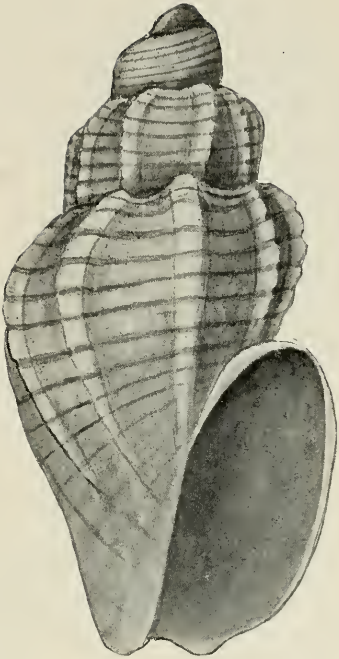

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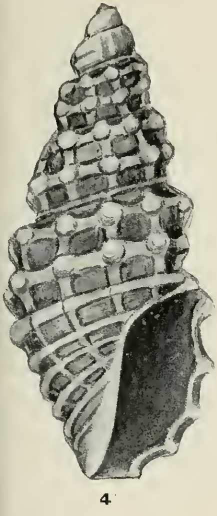

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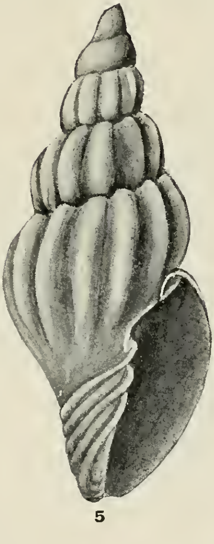

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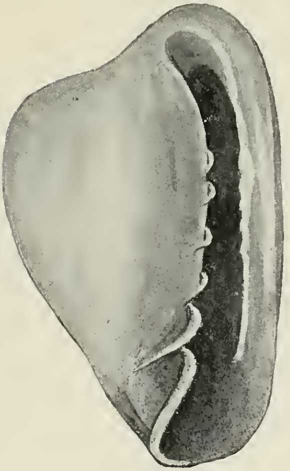

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Fig. 1—TARANIS ACULEATA, N. Sp.

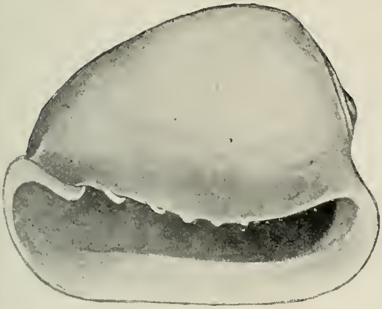
Fig. 2—TARANIS MICROSCOPICA, N. Sp.

Fig. 3—BELA TASMANICA, Sp. Nov.

Fig. 4—CLATHURELLA NODORETE, Sp. Nov.

Fig. 5—VEXILLUM PUMILIO, N. Sp.

Fig. 6—MARGINELLA AURICULATA, Sp. Nov.



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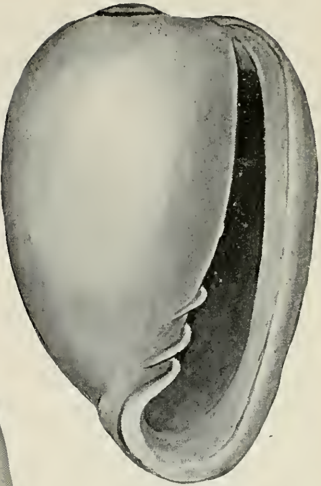

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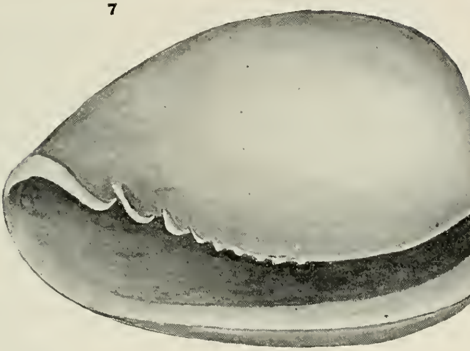

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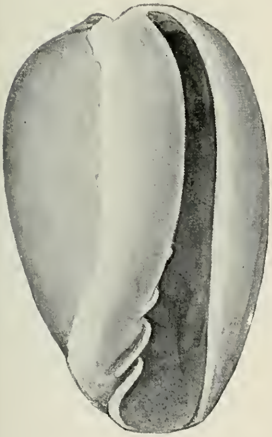

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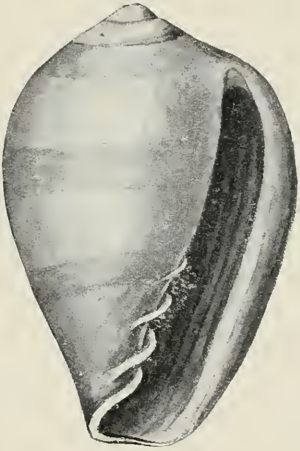

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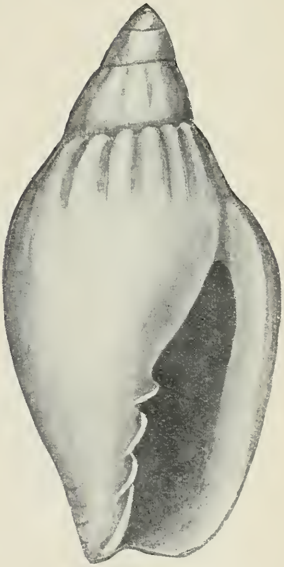

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Fig. 7—MARGINELLA SUBAURICULATA, Sp. Nov.

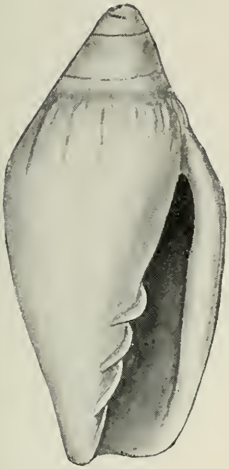
Fig. 8—MARGINELLA THOUINENSIS, Sp. Nov.

Fig. 9—MARGINELLA FREYCINETI, Sp. Nov.

Fig. 10—MARGINELLA PROCELLA, Sp. Nov.

Fig. 11—MARGINELLA CADUCOCINCTA, Sp. Nov.

Fig. 12—MARGINELLA PRÆTERMISSA, Sp. Nov.



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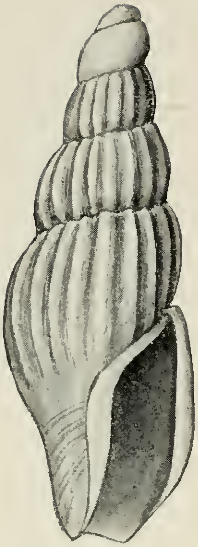

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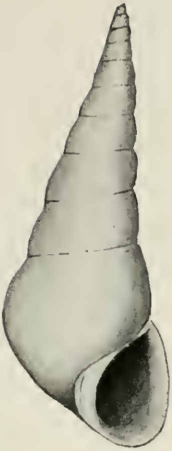

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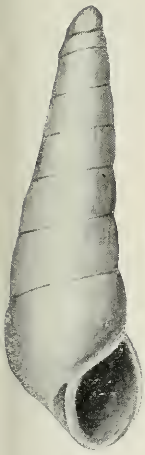

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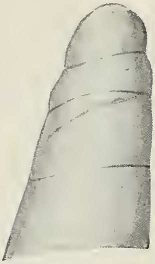

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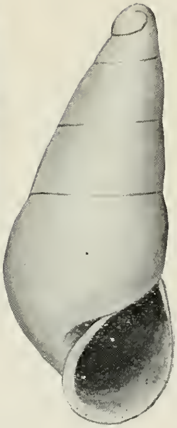

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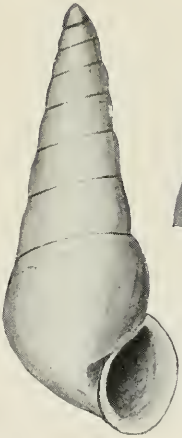

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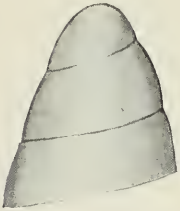


18a

Fig. 13—MARGINELLA GEORGIANA, Sp. Nov.

Fig. 14—ZAFRA COLUMNARIA, Sp. Nov.

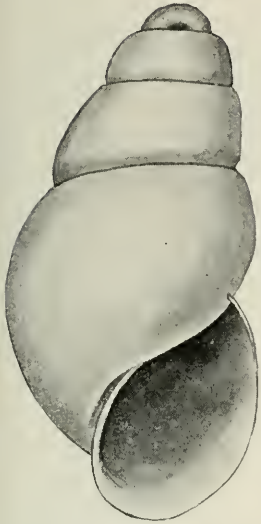
Fig. 15—EULIMA SCHOUTANICA, Sp. Nov.

Figs. 16 & 16a—EULIMA COLUMNARIA, Sp. Nov.

Fig. 17—EULIMA MAMILLA, Sp Nov.

Figs. 18 & 18a—EULIMA CUNÆFORMIS, Sp. Nov.

Plate IV.



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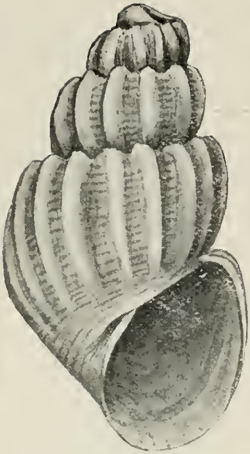

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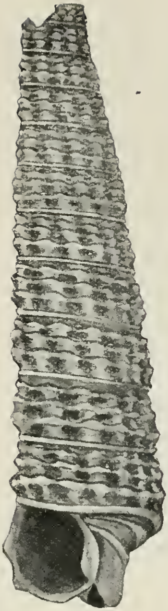

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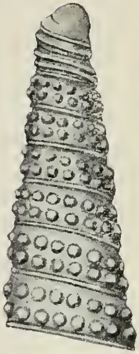

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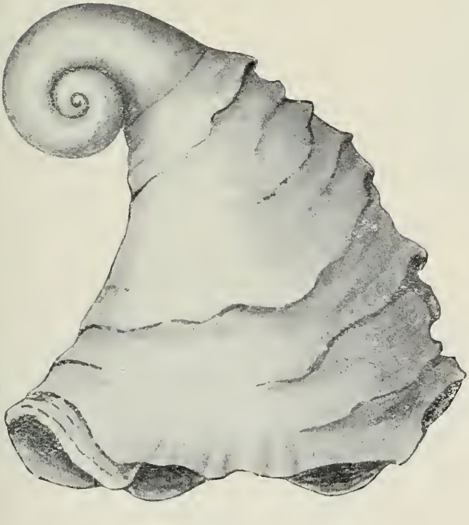

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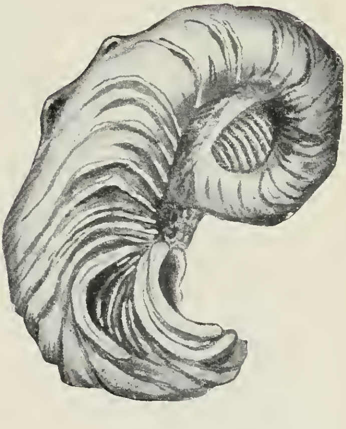


23

Fig. 19—ODOSTOMIA OCCULTIDENS, Sp. Nov.

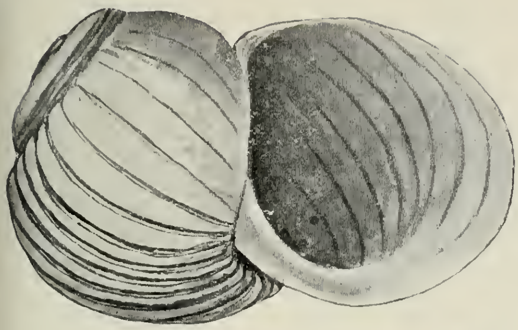
Fig. 20—ODOSTOMIA CRASSICOSTA, Sp. Nov.

Fig. 21—TRIPHORA OBLIQUA, Sp. Nov.

Fig. 21a—Apical portion, further enlarged.

Fig. 22—ROYA DEVEXA, Sp. Nov.

Fig. 23—STREPHOPOMA NUCLEOCOSTATA, Sp. Nov.
(Adult)



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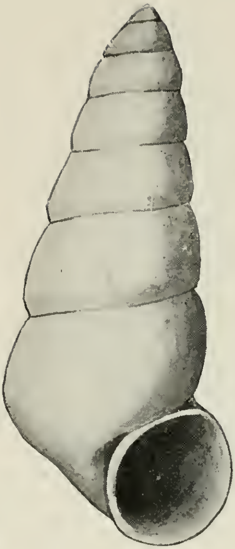

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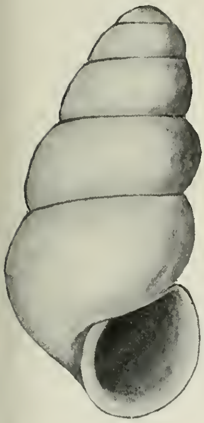

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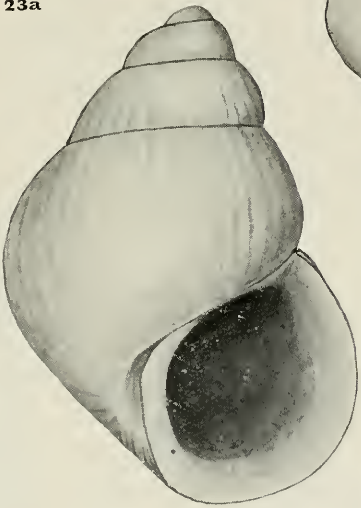

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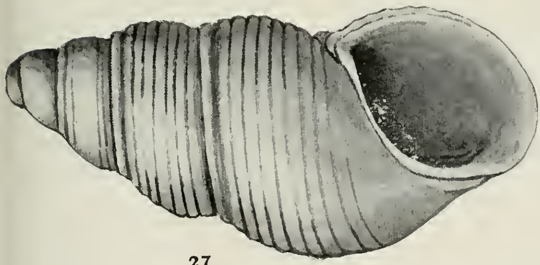

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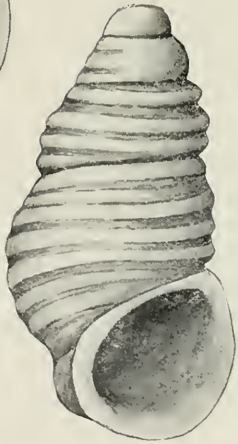


28

ig. **23a**—STREPHOPOMA NUCLEOCOSTATA,
(Nucleus) Sp. Nov.

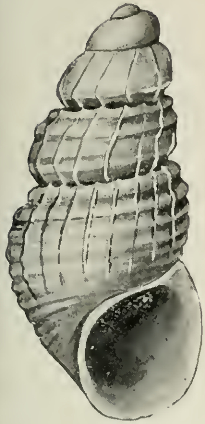
ig. **24**—RISSOA OBELISCUS, Sp. Nov.

ig. **25**—RISSOA PUPOIDES, Sp. Nov.

Fig. 26—RISSOA SIMILLIMA, Sp. Nov.

Fig. 27—RISSOA MULTILIRATA, Sp. Nov.

Fig. 28—RISSOA FREYCINETI, Sp. Nov.



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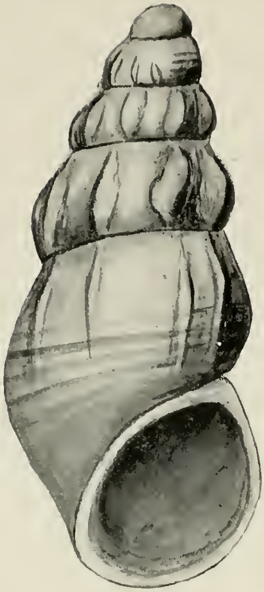

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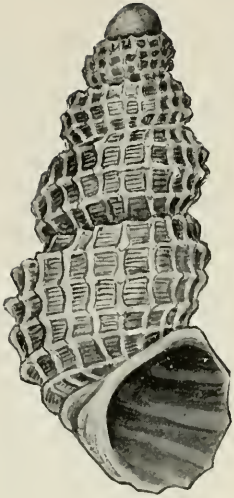

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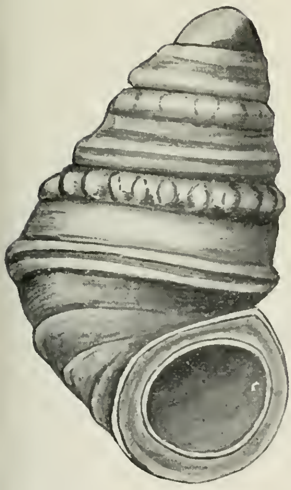

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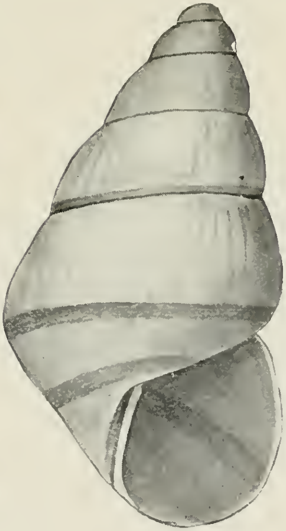

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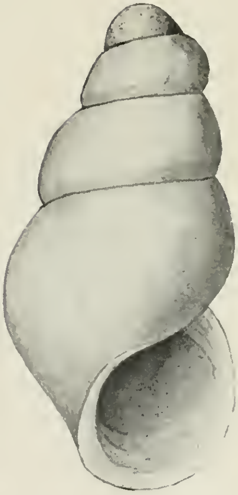


34

Fig. 29—ALVANIA THOUINENSIS, Sp. Nov.

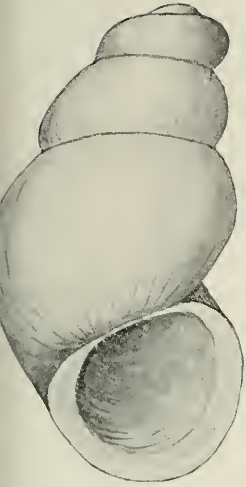
Fig. 30—ALVANIA SEMINODOSA, Sp. Nov.

Fig. 31—ALVANIA SUPRASCULPTA, Sp. Nov.

Fig. 32—AMPHITHALAMUS TRIANGULUS, Sp. Nov.

Fig. 33—AMPHITHALAMUS AURANTIOCINCTUS Sp. Nov.

Fig. 34—AMPHITHALAMUS PERTUMIDUS, Sp. Nov.



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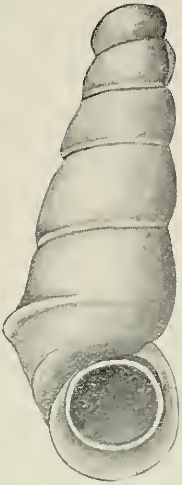

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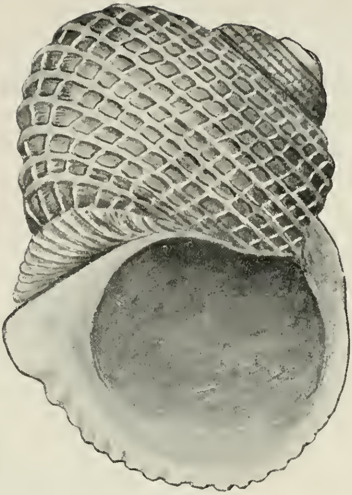

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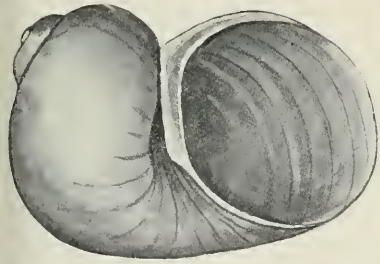

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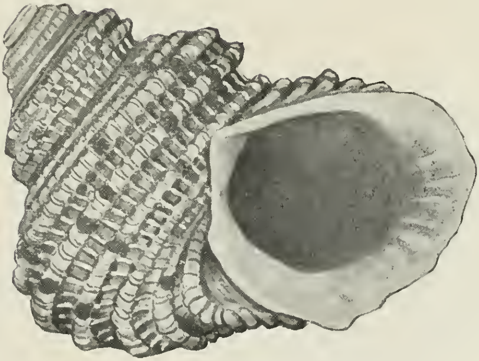


39

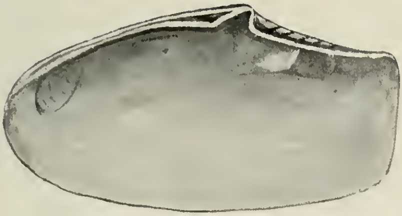
ig. 35—AMPHITHALAMUS TIARA, Sp. Nov.

ig. 36—EPIGRUS SEMICINCTUS, Sp. Nov.

ig. 37—CROSSEA CONSOBRINA, Sp. Nov.

Fig. 38—CIRSONELLA TRANSLUCIDA, Sp. Nov.

Fig. 39—EUCHELLUS PROFUNDIOR, Sp. Nov.



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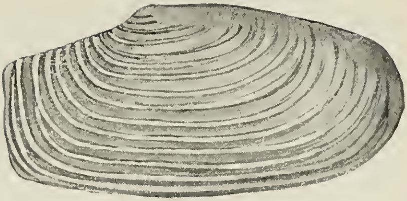

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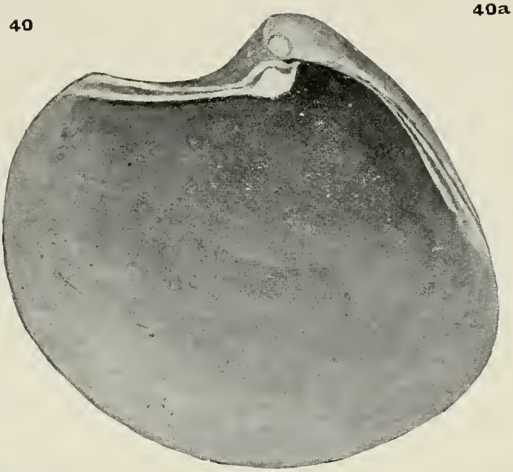

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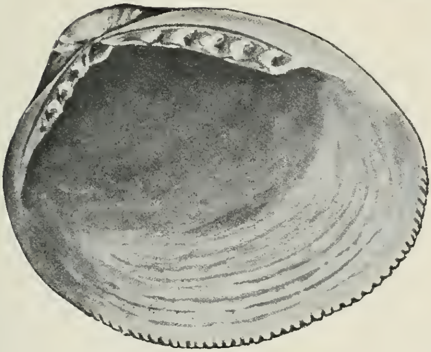

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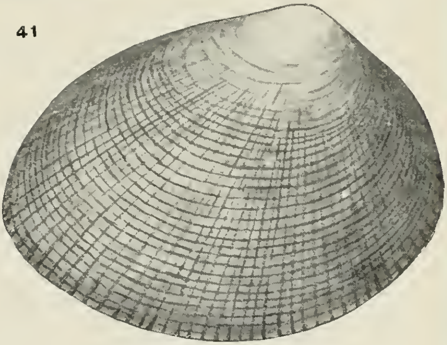

42a

Fig. 40—MYODORA ELONGATA, Sp. Nov.

Fig. 40a—MYODORA ELONGATA, Sp. Nov.

Fig. 41—VERTICORDIA TASMANICA, Sp. Nov.

Fig. 42—PRONUCULA DECOROSA, Hedley var.

Fig. 42a—PRONUCULA DECOROSA, Hedley var.

lowish. Whorls five; protoconch swollen, with a flattened summit. Whorls convex, widest anteriorly. On the body whorl a strong, median keel develops and extends to the lip. There is another small keel on the base. Aperture round, completely margined by a raised edge, and surrounded by a broadly flattened lip. Outer lip strongly varixed behind.

Length 2. Breadth 0.6 mill.

Type, with 12 others, from 40 fathoms, off Thouin Bay. An interesting addition to the genus. Nearest in general appearance to *E. verconis*, Tate, but easily separated by the peculiar keel.

Pl. VII., fig. 36.

CROSSEA CONSOBRINA, Sp. Nov.

Shell small, white, rotund, with a small spire. Whorls three and a half, the apical one and a half smooth. The adult sculpture consists of numerous narrow spiral keels, about twelve on the body whorl, separated by spaces of about twice the width. These latter are crossed by numerous fine axials, irregularly spaced, forming a delicate cancellation. Base narrowly descending, forming a corrugated funicle behind an umbilical crevice. Aperture rounded, the columella lip expanded over the umbilicus, with a straight edge, developing anteriorly into a broad, flattened projection. Outer lip denticulated by the sculpture.

Height 1.7. Diameter 1.9 mill.

Type, with five others, from 40 fathoms, off Thouin Bay. This interesting addition to our fauna is a close ally of *C. cancellata*, Ten.-Woods, from which it is separated by the very different form of the front of the columella, which in *cancellata* is rounded, and has a distinct channel, and has also a larger umbilicus, and is more strongly cancellate. It is well figured by Tate and May, Pro. Linn. Soc., N.S.W., 1901. Pl. XXIII, fig. 1.

Pl. VII., fig. 37.

CIRSONELLA TRANSLUCIDA, Sp. Nov.

Shell small, white, translucid, smooth, except for growth lines, elevated. Whorls three, the apical very minute, rapidly increasing; the last very large. Aperture large, nearly round, slightly pointed above. Columella lip expands over a deep, narrow umbilicus, sometimes covering it, below which it suddenly contracts, and the expansion is very slight. Outer lip simple, thin, expanded above

Height 2.5. Greatest diameter 2.5. Least 2 mill.

Type, with a number of others, from 40 fathoms, off Thouin Bay. Varies much in size, frequently much smaller than the measurements given.

Pl. VII., fig. 38.

EUCHELLUS PROFUNDIOR, Sp. Nov.

Shell rather slender and elevated, colour whitish to yellowish, with irregularly scattered dark brown spots on the keels. (Some co-types have few or no spots.) Whorls four, rounded; spire bicarinate, with two smaller keels on the shoulder. The body whorl has eight keels, the two at the periphery the strongest, the last, which is nodulous, enclosing the umbilical area. The keels and interstices are crossed by numerous fine axial riblets, about 25 to 30 on a half turn of the body whorl. These riblets corrugate the keels, but do not form nodules. Outer lip rather thin, expanded. Columella smooth—not toothed—reflexed, so as to hide the small umbilicus from a front view.

Height 4.5. Breadth 4 mill.

Type, with 20 others, from 100 fathoms, seven miles east of Cape Pillar. Appears to belong to about the hundred fathom line, as it has not been taken in shallower dredgings. It was incorrectly identified as *scabriusculus*, Ad. and Angas, in the Cape Pillar mollusca, but is distinguished from that species by its more slender form and light texture, and the far finer sculpture, the radials in particular being nearly twice as numerous, and in the smooth columella.

Pl. VII., fig. 39.

MYODORA ELONGATA, Sp. Nov.

Shell small, elongate, flattened, equivalve, white, rounded in front, squarely truncated behind, umbo about two-fifths from the posterior end. A low ridge extends from the umbo to the posterio-ventral margin, over which the sculpture is bent. The ornament consists of about eighteen concentric ridges, separated by spaces usually wider than the ridges. The two tooth-like ridges are very similar in each valve.

Length 6. Depth 3.5. Conjoined valves would be about 2 mill.

Type, with five others, all single valves, from 40 fathoms, off Thouin Bay. It has a very distant affinity with M. *albida*, Ten.-Woods.

Pl. VII., fig. 40 and 40a.

VERTICORDIA TASMANICA, Sp. Nov.

Shell small, white, inflated subrhomboidal; umbo much incurved; on its summit a small, smooth, sharply-defined prodissoconch, lunale deeply excavate. Sculpture: The whole surface of the valve is ornamented with very numerous radial rows of minute granules, giving the shell a sandy appearance; at about every five rows is a narrow groove or space. Interior nacreous; under the umbo in the right valve is a massive cardinal, and a small lateral apparently under both dorsal margins.

Height 4. Width 4.5 mill.

Type, from 100 fathoms, seven miles east of Cape Pillar, with several others; also from off Schouten Id., 40 and 80 fathoms. Only a few examples have been taken—all single valves. This species has considerable general resemblance to *V. torrida*, Hedley, but the anterior dorsal slope is much less steep. The sculpture is without the ribs, and it is larger.

Pl. VIII., fig. 41.

A NOTE ON "PALORCHESTES," AS A TASMANIAN PLEISTOCENE GENUS.

By H. H. Scott, Curator of Launceston Museum.

(Received 10th October. Read 15th November.

Issued separately 31st December, 1915.)

Plate IX.

Through the kindness of my friend, Mr. K. M. Harrisson, of Smithton, I received on September 18th, 1915, a small packet of pleistocene fossils from the Mowbray Swamp. These included some Nototherian teeth, previously obtained, and a kangaroo's upper jaw, recently discovered by Mr. T. Edwards. As this latter adds a new genus to Tasmanian Palæontology, I herewith record the fact of its occurrence. (See Plate IX.)

The specimen is generically typical of Prof. Owen's genus "Palorchestes," a gigantic kangaroo, computed to have had a skull over sixteen inches long, or exactly double the size of the existing "Forester."

Viewed palate-wise, as photographed, it is easy to compare it with the similar portion of Prof. Owen's engraving —Fig. I., plate LXXXII. of the Philosophical Transactions, Part IX., 1873—with which it agrees in size and structure.* The specimen includes premolar No. 4, molar No. 1, molar No. 2, and the anterior moiety of molar No. 3. The fragment extends as far in advance of the premolar as the small palatal foramen marked 21′ in Owen's engraving, and backwards it just embraces the maxillary serratures of the maxillo-palatine suture. In width, it about reaches the middle line of the palate, and therefore ends at the mesial maxillary suture. The teeth in our specimen are much better preserved than those used by Prof. Owen for the purposes of his illustration—which latter now constitute specimen No. 46316 of the British Museum extinct marsupial series—indeed, so fine are these teeth in point of preservation that I much doubt if any teeth of Palorchestes hitherto recovered could equal them. The photograph has been more especially arranged to depict the working surfaces of these cheek teeth, and the picture is sufficiently good to make evident their generic departures

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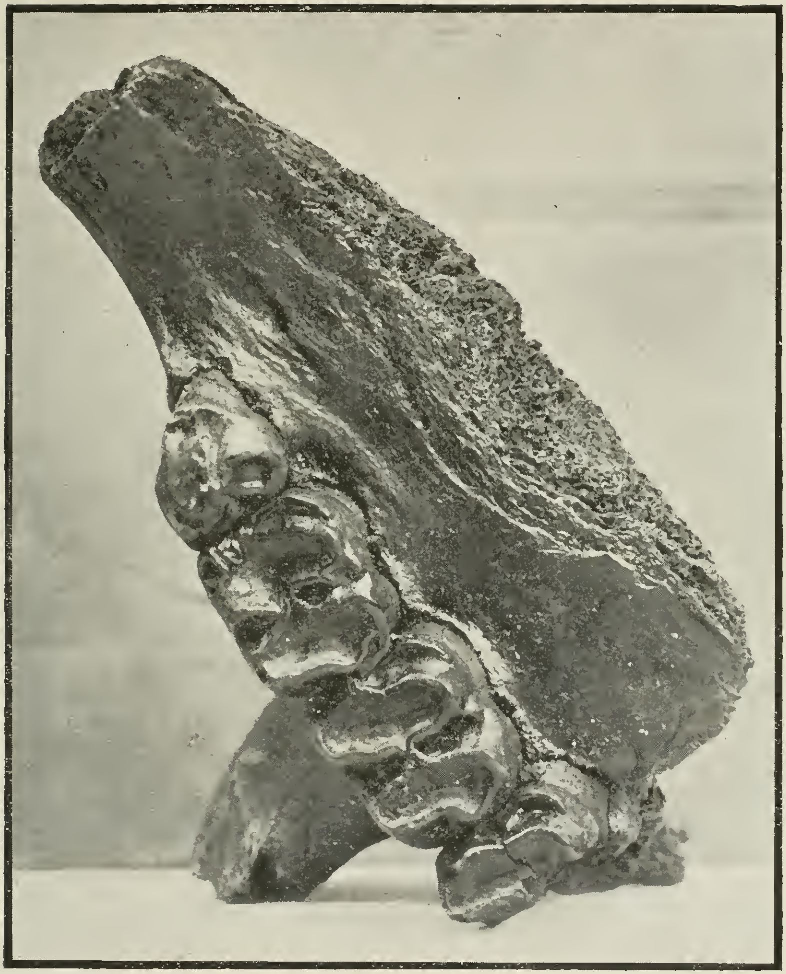
*My thanks are due to Prof. T. T. Flynn, F.L.S., of the Tasmanian University, for the opportunity of consulting this Paper, which is not in our Museum Library.



Right upper maxillary, and cheek teeth, of *Palorchestes*, sp.

From Mowbray Swamp at Smithton, Tasmania

Total length ... . =130 mm.
Tooth line (imperfect) .. . . . = 75 mm.
Width--including zygomatic process of maxillary = 90 mm.

from those of the "Procoptodons," which in point of size they most closely approach. As the present note is chiefly intended to be by way of putting the "find" upon record. I do not propose to enter into such minutiæ as might suggest taxonomic segregation from the mainland form of this extinct animal—the more so as I hope to handle and describe some parts of the appendicular skeleton later on.

A NEW GALL-MAKING THRIPS.

By G. H. Hardy.

(Received 4th October, 1915. Read 15th November.

Issued separately 31st December, 1915.)

Kladothrips Rodwayi, Sp.n.

Imago. Winged; body shining black; antennae generally very pale yellow, sometimes black; anterior tibiae yellow or reddish yellow; anterior femora suffused with reddish, or entirely black; the two small apical joints of the intermediate and posterior legs whitish. Length 3 mm.

Larva. Although I searched numerous galls, I failed to find anything I could consider a nymphal or pronymphal condition. The larvae are variable in colour and markings, starting from very pale yellow or white when young, reaching a condition that is well marked with black. An advanced form of larva has all extremities (namely the legs, antennae and eyes, and the last segment of the abdomen) shiny black, and also two large black spots on the prothorax. Down the abdomen there is sometimes a pair of dark thin stripes, increasing in intensity and converging towards a point, often ending in a ring near the apex, but not reaching the apical segment.

Galls. Similar to those made by *Kladothrips rugosus* (Frog.), as illustrated by fig. 5b. in Mr. Froggatt's article in the "Agricultural Gazette" of N.S.W., 1906. Larvae and imagos inhabit the same gall, and generally the smaller the gall and the more shrivelled the leaf, the bigger the percentage of imagos to be found in them.

Habitat. Hobart, May, 1915; in galls on *Acacia melanoxylon* (Blackwood).

Mr. Froggatt in his above-mentioned article, pg. 1,011, gives a description of his *Kladothrips rugosus*; a technical description has not yet been published for the genus. *K. rodwayi* is very near *K. rugosus*, and differs from the description chiefly in having the thorax and the first segment of the abdomen black.

I am indebted to Mr. Rodway for drawing my attention to this species, and for the name of the tree. He obtained the specimens from two trees standing on the Waterworks track half-way between Gentle Annie Falls and the Fern Tree Hotel. I subsequently visited the spot, but failed to find galls similar to Mr. Froggatt's figs. 5 and 5a.

The type specimen is mounted on a microscope slide with two others; there are also three other cotypes mounted in the same manner, and a number of specimens in spirits. I am indebted to Mr. H. M. Nicholls, Government Entomologist and Pathologist, for mounting the specimens.

I failed to find any case of parasitism in these galls. Many anomalies, however, came under my notice which seem to forecast an interesting life history.

ADDITIONS TO THE TASMANIAN FLORA.

By L. Rodway.

(Received 15th November. Read 15th November.

Issued separately 31st December, 1915.)

The few additions here made to our flora are all cryptogamic. Of the true mosses *Fissidens tasmanicus* and *Amblystegium austro-serpens* are endemic, and recently described by Prof. V. F. Brotherus, of Helsingfors. The second genus was not previously represented in Tasmania. Of the Hepatics, the presence of *Pallavicinius connivens* on our mountains is another connecting link with New Zealand flora. *Chiloscyphus kirkii* also was hitherto only recorded from New Zealand. *Calypogeia tasmanica* adds a new genus as well as species to our list. Of the two fungi it is not surprising that the Geoglossum appears as it is common in Australia, but the Mitrula has not hitherto been recorded south of the equator.

We now claim two *Geoglossums* and three *Mitrulas.*

Geoglossum glabrum, Pers.

Geoglossum hirsutum, Pers.

Mitrula berterii, Mont.

Mitrula cucullata, Fries.

Mitrula olivacea, Sacc.

MOSSES.

Fissidens tasmanicus, V. F. Brotherus. Plant about 1 cm.; leaves numerous, erecto-patent, linear, up to 1.8 mm. long; apex subacute; margin not bordered, entire; sometimes undulate or subserrulate above; nerve narrow, lost in the apex; lower part of the sheath with a band of about 4 long cells, just within the margin; cells rotundo-quadrate, irregular, about 10μ. diameter; cuticle smooth.

Very close to *F. strictus, H.f.W.*, to be distinguished by the band towards the margin of the sheath.

Submerged, Newman's Creek, Tasman Peninsula, W. A. Weymouth.

Amblystegium, Br. Sch.

This is one of the Genera into which the old genus Hypnum has been subdivided. An ill-defined group, it is differently accepted by botanists. Following Brotherus, Braithwaite, and many others, it is here understood as:—

Slender, pinnately branched, growing in wet places. Leaves equal in 5-8 rows, ovate or cordate straight, acute; nerve vanishing above the centre; cells small, elliptic to rhomboid, seldom narrow linear. Capsule, etc., as in Hypnum. Close to Hypnum, distinguished by the broader cells.

Amblystegium austro-serpens, Broth. Stems flaccid, about 1 cm. Leaves acutely acuminate from a rotund or ovate base, 0.5 mm. long; margin entire; nerve slender, lost above the middle; cells oblongo-rhomboid.

In stream at mouth of River Huon.

Drapanocladus sendtneri (*Sch.*). Long, slender, with short lateral branches. Leaves 1-2 mm. long, broadly lanceolate, falcate, with a tapering slender apex, but not very long, margin entire, nerve strong, lost remote from apex. Cells at the basal angle little enlarged, with thickened yellow walls.

Distinguished from *D. fluitans* by the shorter, broader, less curved leaves, margin entire, basal angulars yellow, thick walled. In *D. fluitans* the leaves are linear-lanceolate, very attenuated apex, very curved, nerve stronger, 2 mm. long, margin dentate near apex, basal angular cells, inflated hyaline.

In almost dry creek, McRobie's Gully. W. A. Weymouth. Determined by Prof. Brotherus.

Philonotis australis, Mitt. Stems mostly 2 cm. long; leaves erecto-patent, crowded, imbricate, lanceolate, with an acuminate apex, 1.3 mm. long, margin acutely dentate, nerve rotund, bold, dentate, shortly excurrent; cells rectangular, those of the base more quadrate. Resembling *P. tenuis. Tayl.*, only leaves smaller, more crowded, also of a more compact habit.

St. Mary's Pass. W. A. Weymouth. Determined by Prof. Brotherus.

Bartramidula pusilla (*H. f. et W.*), *Schimper.* This moss is diœcious. Antheridial plants, erect, about 1cm., leaves oblong, closely appressed, antheridia in the axils of the upper leaves.

This is responsible for the record of *Pleuridium nervosum* for Tasmania.

HEPATICS.

Marsupidium piliferum, St. Erect, 5-10 mm., simple. Leaves succubous, nearly transverse, broadly oblong, amplexicaul; apex with two long acute spinelike lobes.

Adamson Peak, Trowutta.

Aplozia alpina, Spec. nov. Stems weak, slender, often 2-3 cm. long. Leaves mostly distant, rotund, very concave, nearly transverse, mostly 0.7 mm. long, bracts rather longer. Perianth 2 mm. long, fusiform tapering to a narrow 3-lobed mouth, dorsal surface, with an obtuse keel, ventral with a broad, deep groove. All parts green. Stunted forms sometimes have a shorter perianth, with a wider 3-lobed mouth, and a small, shortly bifid bracteole.

Mt. Wellington plateau.

Pallavicinius connivens (Col.), St. Erect, from a terete rhizome, 1-2 cm., lower portion slender terete, upper part 2-3 times forked, broadly winged, flabellate, edges involute, margin strongly dentate. Fruit towards the base of the primary fork on the dorsal surface of the midrib. Involucre short, cup-shaped, with a fimbriate mouth; perianth broadly cylindric, 3-4 mm., mouth fimbriate. Spores yellow, marked with short, sinuate, shallow ridges or irregular papillae, 30μ.

Mt. Wellington plateau, New Zealand.

Chiloscyphus kirkii, St. Differing from *C. conjugatus, Mitt.*, by its smaller size, ventral margin usually armed with one or two teeth, dorsal margin with a small dentate enlargement at the base, underleaves armed with a few short teeth, very slightly joined to the leaves, and the cuticle covered with relatively large, short papillæ.

Gathered on Adamson Peak, Ida Bay, and Mt. Field. Also New Zealand.

Chiloscyphus cordifolius, Nov. Spec. Robust, 4-6 cm. long, densely pulvinate, yellow. Leaves erecto-homomallus, closely imbricate, alternate, rotund, 1 mm. long, rather broader than long, both bases cordate and free, margin entire, cells towards the margin 16μ. diameter, lower ones 33μ., trigones as large as the cells, confluent, cuticle smooth. Underleaves rotund, concave, imbricate, free, 0.7 mm. long, margin entire, or with about 6 obtuse angles. Specimen sterile.

Adamson Peak.

Calypogeia Raddi.

Stems weak, simple, or with few branches proceeding from the axils of the underleaves. Leaves incubous, oblong, or ovate, apex entire obtuse or acute, rarely bidentate, margins entire. Underleaves rotund to reniform, apex usually bifid. The productive organs on very short branches arising from the axils of the underleaves. Sporophyte inserted in a descending fleshy marsupium.

The genus comes next in our flora to *Bazzanai* (Mastigobryum), but differs not only in the insertion of the sporophyte, but also in the shape and structure of the leaves.

Calypogeia tasmanica, Spec. nov. Slender, in loose mats, stems often 3-5 cm. long, with few, irregular, ventral branches. Leaves not crowded, but little overlapping, rotundo-ovate, apex entire, or ocasionally bilobed near the apex, 1 mm. long; cells hexagonal, walls rather thin, trigones none, 30-45μ. Underleaves free, sub-rotund, bifid or trifid, divided to the middle, lobes obtuse, half as long as the leaves. Specimen sterile.

Adamson Peak.

FUNGI.

Geoglossum hirsutum, Pers. Erect, clavate, black, 3-6 cm., high, densely velvety all over, upper half rather flattened and broader than the stipes, ascigerous. Asci clavate, spores 8, linear ends slightly narrowed, 7-15 septate, 110-150 x 5-6μ., light brown, paraphyses slender, septate, tips brown.

On tree-fern slopes of Mt. Wellington. Cosmopolitan.

Mitrula olivacea, Sacc. Dingy green, 3-4 cm. high, slender terete or flattened in the fertile portion, smooth. Asci narrow clavate. Spores 8, obliquely elliptic, with rounded ends, 14 x 6μ., colourless, smooth, not septate.

Gully near mouth of the Huon. Also Europe.

NOTES ON A GRAFT-HYBRID.

(By L. Rodway, Government Botanist.)

Plate X.

(Read August 9, 1915.

Issued separately 31st December, 1915.)

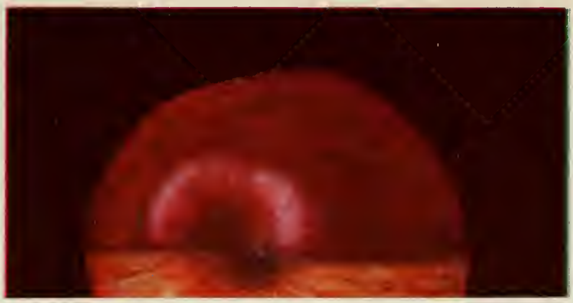
Recently Mr. Osborne, the fruit expert in the Agricultural Department, handed me an apple of which one-half was typical Roman Beauty and the other as surely Senator. There was no blending; the division was longitudinal through the median plane and as clearly defined as it was possible to be.

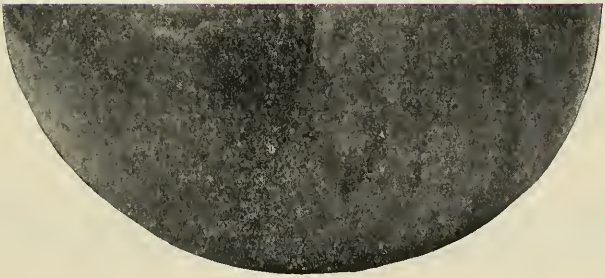
The apple was grown in the orchard of Mr. Bourne, Premaydena, South-East Tasmania.

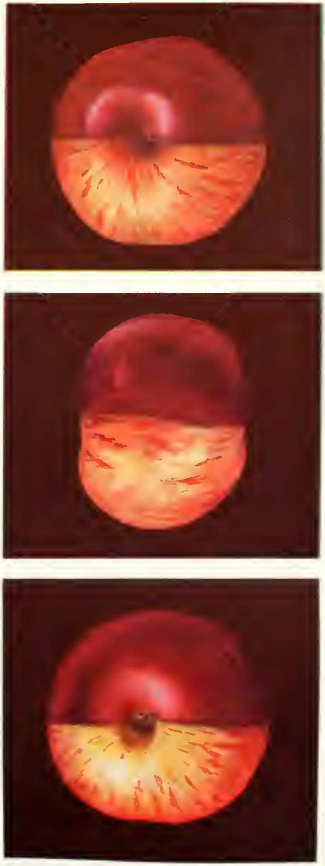
The following note is sent with it from Mr. Ward, assistant fruit instructor:—

> "The apple was picked from a Roman Beauty tree which had been grafted on a Senator stock. The tree is young, as far as I know seven or eight years old. This was the only apple of its kind on the tree."

Judging from its history and appearance there seems little escape from the conclusion that this is a genuine case of graft-hybridism. Reversion would not have given us a fruit with such a well-marked distinction of character in the two halves. Cross-fertilisation has not yet demonstrated more than at most a slight general influence. The chance of mutation producing such a sport, bearing half the character of the stock and half of the scion, is unthinkable. Till some other reasonable explanation is forthcoming we must fall back on the belief that the Senator stock is responsible for the presence of the Senator half-fruit. This belief is not new, but its present advance is justified from its unmistakeable authenticity. A considerable difficulty arises when we try to account for the phenomenon. One apple alone was influenced. In other recorded cases it is always a case of partial, not general, influence. Even in experiments with potato tubers the characters are not blended. This points to a vitalistic, not nutritional, cause. If vitalistic, it must be due to a migrating nucleus or an influence transmitted through protoplasmic filaments connecting stock and scion. If the protoplasts of stock and scion become continuous through such filaments we would expect any influence transmitted to be general, and not as







[illegible] [illegible] Rome Beauty

(Natural size)

fortuitous as is this instance. Besides this, if characters may be transmitted along the filaments, we must reconsider our present position in regard to heredity. There is no evidence to prove it, but the simplest conclusion would be that of a migrating nucleus. It is quite out of the question that a nucleus can have migrated through normal tissue from stock to varying bud. Even if fragmented it does not seem to be feasible. We require a more direct route for the entire nucleus. Such a course may be provided by the conditions of grafting. A wound is made in the cambium of the stock. Many cells are opened and their nuclei set free. There is fair reason to believe that freed nuclei, under suitable conditions, may retain vitality for a considerable time. A bud or twig of a scion is thrust into the wound and bound round with isolating material. The scion starts into growth; a vigorous transpiration current is set up in the vessels, and it is not at all unreasonable that some of the free nuclei may be carried by the current to the growing point. If such living nuclei can maintain themselves under these conditions it requires no violence to biologic ideas to conclude that they may assert their presence at the growing point and produce the characteristic form of variety from which they came.

The plates are the work of Mr. L. Dechaineux.

ABSTRACT OF PROCEEDINGS

1915

22nd March, 1915.

Annual Meeting.

The Annual General Meeting was held at the Museum at 8 p.m., the President in the chair.

The Annual Report and balance sheet for 1915 were read by the Assistant Secretary. They were adopted on the motion of the President, seconded by Dr. Clarke.

No more nominations having been received than were required to fill the vacancies on the Council, the President declared the following duly elected for 1915:—Dr. A. H. Clarke, Messrs. L. H. Lindon, L. F. Giblin, L. Dechaineux, J. A. Johnson, L. Rodway, E. L. Piesse, Professor T. T. Flynn, and Dr. J. L. Glasson.

On the motion of Mr. Rodway, Mr. H. W. Echlin was reappointed Auditor for 1915.

Mr. E. Morris Miller proposed a vote of thanks to Mr. E. L. Piesse for his many valuable services to the Society in the reorganisation of its Library and the editing of its Journal. The motion was supported by Mr. Rodway and carried by acclamation.

12th April, 1915.

The Monthly General Meeting was held in the Museum at 8 p.m., the President in the chair.

Election of Members.

Messrs. Herbert Heaton, M.A., M.Comm., and S. C. Smith, B.A., were elected members.

Hydro-Electricity.

Capt. J. H. Butters, Chief Engineer and General Manager of the Hydro-Electric Department, gave an illustrated address on the Hydro-Electric Power Scheme.

10th May, 1915.

The Monthly General Meeting was held at the Museum at 8 p.m., the President in the chair.

Election of Members.

Messrs. V. V. Hickman, B.Sc., and Evan Williams, B.Sc., were elected members.

Conversazione.

The meeting took the form of a Conversazione, in which the following took part. Mr. L. Rodway gave a lecture on the Pulping Qualities of Tasmanian Timbers. Professor T. Thomson Flynn exhibited biological slides with the micro-lantern. Dr. J. L. Glasson exhibited experiments illustrative of the discharge of electricity through rarefied gases. Mr. R. M. Johnston exhibited some calculating machines. Medhurst Ltd. exhibited scientific cinematograph films.

21st June, 1915.

The Monthly General Meeting was held at the Museum at 8 p.m.

Forestry.

Mr. D. E. Hutchins, F.R.G.S., formerly of the South African Forest Department, read a paper on Forestry for Tasmania.

12th July, 1915.

The Monthly General Meeting was held at the Museum at 8 p.m.

Paper.

The following paper was read:—

"Tasmanian Diptera-Brachycera, Part II." By A. L. White.

Tasmanian Press.

Mr. H. Heaton, M.A., delivered a lecture on "The Early Tasmanian Press and Its Struggle for Freedom."

9th August, 1915.

The Monthly General Meeting was held at the Museum at 8 p.m., the President in the chair.

Papers.

The following papers were read:—

"Notes on a Graft Hybrid." By L. Rodway.

"Description of Pseudopeziza casuarinae." By L. Rodway.

Tasmanian Mountain Scenery.

Messrs. W. F. D. Butler and L. Rodway exhibited a number of lantern slides illustrative of Tasmanian mountain scenery.

13th September, 1915.

The Monthly General Meeting was held at the Museum at 8 p.m., the President in the chair.

Papers.

The following papers were read:—

"List of Tenison-Woods types in the Tasmanian Museum." By G. H. Hardy.

"Additions to the Tasmanian Marine Mollusca with descriptions of new species." By W. L. May.

The Platypus.

Professor T. Thomson Flynn lectured on the life and habits of the Platypus.

11th October, 1915.

The Monthly General Meeting was held at the Museum at 8 p.m., the President in the chair.

Paper.

The following paper was read:—

'Notes on the Genus Pelecorhynchus." By G. H. Hardy.

Australian Exploration.

Mr. L. Dechaineux delivered an address on "The French and English in Australia."

15th November, 1915.

The Monthly General Meeting was held at the Museum at 8 p.m., the President in the chair.

Papers.

The following papers were read:—

"Note on Palorchestes as a Tasmanian Pleistocene Genus." By H. H. Scott.

"A New Gall-making Thrips." By G. H. Hardy.

"Additions to the Tasmanian Flora." By L. Rodway.

Nietzsche.

Mr. E. Morris Miller, M.A., delivered a lecture on "Nietzsche and the Morality of Might."

A further exhibit of supposed cases of Mimicry.

In July, 1914. Mr. G. H. Hardy exhibited some specimens of an Ichneumon (species not determined), having a colour pattern identical with some very common Bracons (species not determined). Mr. Hardy now exhibited a number of Ichneumons belonging to four definitely distinct species, for each one of which there is a Bracon having identical, or almost identical, colour patterns.

The species exhibited were as follow:—

No. 1. Four female specimens subfamily Pimplides, having no areolet. The head, the thorax as far back as the posterior wings and intermediate legs, and also the anterior legs, red. The abdomen black, and apex of segments white, all other portions including the wings black. Mr. Littler has two male specimens of this. There is a Bracon with an identical colour pattern.

No. 2. 1 female specimen subfamily Pimplides, probably of distinct genus to the last, having no areolet. Head only red; anterior and intermediate legs black above, and white, or partly white, below; other colours as in the first species. There is a Bracon with identical colours, except that there is no white on the legs, and there is a small patch of red hidden on the under side of the prothorax.

No. 3. 1 male specimen, very distinctive, subfamily undetermined. Head and anterior legs red; the apex of the thorax including the median segment white, also a white dot at the base of the posterior wings; colour of all other portions as in No. 1. In the nearest Bracon there is no white on thorax, and the red on the anterior legs spreads to the under side of the prothorax. The Ichneumon is distinguished by having swollen femora.

No. 4. Seven specimens, males, having very Bracon-shaped abdomens. Subfamily undetermined. Head only red; thorax and legs entirely black; colour of other portions as in No. 1. A Bracon has identical colour pattern, except that the underside of the prothorax is red.

Mr. Hardy also exhibited a further and unexpected case of apparent mimicry in which these Bracons again form the pattern. A Hemipteron, probably family Capsidae, has the colour pattern identical with a further species of this widely variable group of black winged Bracons. The head of the Hemipteron is black, the thorax mostly red, the wings and abdomen black. The median segment of the nearest Bracon is black, a corresponding part on the thorax of the Hemipteron is also black. The basal half of the wings in the Bracon is lighter than the apical half, the Hemipteron has the tegmina and wing both with a whitish streak in imitation. From above, the sides of the basal segment of the abdomen of the Bracon are whitish; the Hemipteron imitates this by having the abdomen suitably constricted and edged with white. Dr. Clarke took this specimen whilst helping me to collect in the neighbourhood of Nubeena on the 14th February, 1915. He handed it to me alive as a specimen of a Bracon. Further specimens were searched for but not found.

ANNUAL REPORT.

The Royal Society of Tasmania

1915.

Patron:
HIS MAJESTY THE KING.

President:
HIS EXCELLENCY SIR WILLIAM GREY ELLISON-MACARTNEY, P.C., K.C.M.G., GOVERNOR OF TASMANIA.

Vice-Presidents:

Council:
Elected 22nd March, 1915.

A. H. CLARKE, M.R.C.S., L.R.C.P. (*Chairman*).
L. DECHAINEUX.
PROF. T. THOMSON FLYNN, B.Sc.
L. F. GIBLIN B.A., M.H.A.
J. L. GLASSON, B.A., D.Sc.
J. A. JOHNSON, M.A.
L. H. LINDON, M.A.
E. L. PIESSE, B.Sc., LL.B.
LEONARD RODWAY.

Honorary Secretary:
J. L. GLASSON.

Honorary Treasurer:
LEONARD RODWAY.

Honorary Librarian:
E. L. PIESSE.

Assistant Librarian:
L. DECHAINEUX.

Editor:
J. L. GLASSON.

Auditor:
H. W. W. ECHLIN

Honorary Members:

David, T. W. Edgeworth, C.M.G., B.A., F.R.S., F.G.S. Professor of Geology and Physical Geography in the University of Sydney. The University, Sydney.

Mawson, Sir Douglas, B.E., D.Sc. Adelaide.

Shackleton, Sir Ernest H., Kt., C.V.O., F.R.G.S., F.R.A.S. 9 Regent-street, London, S.W., England.

Spencer, W. Baldwin, C.M.G., M.A., F.R.S. Professor of Biology in the University of Melbourne. The University, Melbourne.

Ordinary, Life, and Corresponding Members:

"C," Corresponding Member.
"L," Member who has compounded subscriptions for life.
*, Member who has contributed a Paper read before the Society.

Year of Election.		
1908	L	Baker, Henry D. C/o American Consulate, Hobart.
1887		Barclay, David. 143 Hampden Road, Hobart.
1890		*Beattie, J. W. 1 Mount Stuart Road, Hobart.
1901	C	Benham, W. B., M.A., D.Sc., F.R.S., F.Z.S. Professor of Biology, University of Otago. Dunedin, New Zealand.
1903		Bennett, W. H. "Ashby," Ross.
1900		Bennison, Thomas. 29 Cromwell Street, Hobart.
1912		Black, R. A. Chief Clerk, Department of Agriculture. 50 High Street, Queenborough.
1909		*Blackman, A. E. Franklin.
1913		Bottrill, W. E., LL.D. 7 Elphinstone Road, Hobart.
1892	C	Bragg, W. H., M.A., F.R.S. Professor of Physics in University College, London.
1913		Brammall, T. C., M.A. "Blenheim," 195 Brisbane Street, Hobart.
1900		*Brettingham-Moore, G. E. 294 Davey Street, Hobart.
1911		Brooks, G. V. Master of Method, Elizabeth Street Practising School, Hobart. Main Road, New Town.
1907		Brownell, F. L. "Leura," Main Road, Moonah.
1900		*Burbury, F. E. South Esk Street, Trevallyn.
1879		Burgess, The Hon. W. H. "Milliara," Mona Street, Hobart.

Year of Election.		
1861		Butler, Francis. Garden Crescent, Hobart.
1909		Butler, W. F. D., B.A., M.Sc., LL.B. Bishop Street, New Town.
1912		Chapman, J. R. Holebrook Place, Hobart.
1901	C	Chapman, R. W., M.A., B.C.E. Elder Professor of Mathematics and Mechanics in the University of Adelaide. The University, Adelaide.
1913		Chepmell, C. H. D. Clerk of the Legislative Council. 23 Swan Street, Hobart.
1896		*Clarke, A. H., M.R.C.S., L.R.C.P. Macquarie Street, Hobart.
1887		Clemes, Samuel. Principal of Leslie House School. Clare Street, New Town.
1910		Clemes, W. H., B.Sc. Leslie House School, Argyle Street, New Town.
1877		*Crouch, E. J., M.R.C.S., L.S.A. 184 Macquarie Street, Hobart.
1884		Davies, The Hon. C. E., M.L.C. "Lyndhurst," New Town Road, New Town.
1908		Dechaineux, Lucien. Principal of Technical School, Hobart.
1903		Delany, Most Rev. Patrick. Archbishop of Hobart. 99 Barrack Street, Hobart.
1892	C	Dendy, A., D.Sc., F.R.S., F.L.S. Professor of Zoology in the University of London (King's College). "Vale Lodge," Hampstead, London, N.W.
1861		Dobson, The Hon. Henry. Elboden Street, Hobart.
1911		Dunbabin, Thomas, M.A. 22 Lansdowne Crescent, Hobart.
1908		Ernst-Carroll, Frederick J., M.Sc., F.R.G.S., F.G.S. 24 Amselstrasse, Basle, Switzerland.
1913		Erwin, H. D., B.A. Christ's College, Macquarie Street, Hobart.
1909		Fereday, Mrs. R. W. Holebrook Place, Hobart.
1902		Finlay, W. A. 11 Secheron Road, Hobart.
1909		*Flynn, T. Thomson, B.Sc. Ralston Professor of Biology in the University of Tasmania. D'Arcy Street, Hobart.
1890	L	Foster, H. D. 137 Hampden Road, Hobart.
1905	L	Foster, J. D. "Fairfield," Epping.

Year of Election.		
1913		Fowler, T. W., M.C.E. Engineer-in-Chief of Tasmania. Clare Street, New Town.
1908		*Giblin, L. F., B.A., M.H.A. 326 Macquarie Street, Hobart, and "Cobbler's End," Cambridge.
1913		*Glasson, J. L., B.A., D.Sc. Lecturer in Physics in the University of Tasmania. The University, Hobart.
1914		Goetze, A.E. Bellerive.
1907		Gould, H. T. 324 Murray Street, Hobart.
1907		Gould, Robert. Longford.
1905	L	Grant, C. W. "High Peak," Huon Road.
1892		*Green, A. O Fern Tree.
1901	C	*Hall, T. S., M.A., D.Sc. Lecturer in Biology in the University of Melbourne. The University, Melbourne.
1913		*Hardy, G. H. Hurlstone. Assistant-Curator of the Tasmanian Museum. The Museum, Argyle Street, Hobart.
1898		Harrison, M. W. Glenorchy.
1893		Harvey, W. A., M.B. 154 Macquarie Street, Hobart.
1902	C	Haswell, William, M.A., D.Sc., F.R.S., F.L.S. Challis Professor of Biology in the University of Sydney. The University, Sydney.
1913		Hawson, Edward. "Remine," 174 Argyle Street, Hobart.
1915		*Heaton, Herbert, M.A., M. Comm. Lecturer in History and Economics in the University of Tasmania. The University, Hobart.
1915		Hickman, V. V., B.Sc. Lecturer in Chemistry, School of Mines, Zeehan.
1914		Hitchcock, W. E. Moina.
1908		Hogg, G. H., M.D., C.M. 37 Brisbane Street, Launceston.
1909		*Hutchison, H. R. 1 Barrack Street, Hobart.
1913		Ife, G. W. R., LL.B. Summerhill Road, Hobart.
1912		Inglis, C. J. Holebrook Place, Hobart.
1898		*Ireland, E. W. J., M.B., C.M. 160 Elizabeth Street, Hobart.
1887	C	Jack, R. L., F.G.S., F.R.G.S.

Year of Election.		
1906		*Johnson, J. A., M.A. Principal of the Philip Smith Training College, Hobart. "Wharepuke," Argyle Street, New Town.
1873		*Johnston, R.M., I.S.O., F.S.S. Government Statistician. Tasmanian Club, Macquarie Street, Hobart.
1913		Johnstone, G. M., LL.M. Augusta Road, New Town.
1911		Keene, E. H. D., M.A. "Tantallon," Tarleton.
1910		Kermode, R. C. "Mona Vale," Ross.
1905		Kerr, George. 165 Campbell Street, Hobart.
1913		Knight, J. C. E. "Windermere," Claremont.
1873		*Legge, Col. W. V., R.A. (R.). "Cullenswood House," Cullenswood.
1887		Lewis, Sir Neil Elliott, K.C.M.G., M.A., B.C.L., LL.B., M.H.A. "Werndee," Augusta Road, New Town.
1912		Lindon, L. H., M.A. Warden of Christ's College, Hobart. "The Lodge," Park Street, Hobart.
1900		Lines, D. H. E., M.B., Ch.B. Archer Street, New Town.
1875	C	Liversidge, Professor Archibald, M.A., LL.D., A.R.S.M., F.R.S., F.I.C., F.C.S., F.G.S., F.R.G.S. "Fieldhead," Coombe Warren, Kingston, Surrey, England.
1913		Lord, Clive E. "Lauramont," High Street, Queenborough.
1912		McAlister, Miss M. K. Rosetta.
1893		*McAulay, Alexander, M.A. Professor of Mathematics in the University of Tasmania. The University, Hobart.
1914		McClintock, S. A., M.D., D.P.H., D.T.M. and H.
1884	L	*McClymont, J. R., M.A. Grosvenor Street, Queenborough.
1908		McElroy, J.A. Principal of Franklin House School. 179 Davey Street, Hobart.
1913		Mackay, J. Hilton, M.C.E. Professor of Engineering in the University of Tasmania. The University, Hobart.
1902	C	*Maiden, J. H., F.L.S., F.C.S. Director of Botanic Gardens, Sydney, and Government Botanist, New South Wales. Botanic Gardens, Sydney.

Year of Election.		
1913		Mather, J. F. 1 Mount Stuart Road, Hobart.
1895		*May, W. L. "Forest Hill," Sandford.
1909		Millen, J. D. Mount Bischoff Mine, Waratah.
1913		Miller, E. Morris, M.A. Lecturer in Philosophy in the University of Tasmania. 38 Church Street, Hobart.
1907		Miller, Lindsay S., M.B., Ch.B. 156 Macquarie Street, Hobart.
1894	L	Mitchell, J. G. "Ellesmere," Jericho.
1913		Mitchell, P. H., B.A. Headmaster of the State High School, Hobart. 2 Ashfield Street, Queenborough.
1911		Montgomery, R. B. Park Street, New Town.
1882		Nicholas, G. C. "Cawood," Ouse.
1910		Nicholls, H. Minchin. Government Microbiologist, Department of Agriculture. Macquarie Street, Hobart.
1908		Parsons, Miss S. R. 190 Davey Street, Hobart.
1909		Pearce, E. H. 103 Hampden Road, Hobart.
1902		*Piesse, Major E. L., B.Sc., LL.B. "Neika," Bay Road, New Town.
1910		Pillinger, James. 4 Fitzroy Crescent, Hobart.
1908		Pratt, A. W. Courtney. 11 Swan Street, Hobart.
1911		Reid-Bell, W. Burnie.
1904		*Ritz, H. B., M.A. Lecturer in Modern Languages in the University of Tasmania. 40 Lochner Street, Hobart.
1864		Roberts, H. L. "Beaumaris," Montpelier Road, Hobart.
1914		Robertson, T. W. "Fenham," Elphin Road, Launceston.
1884		*Rodway, Leonard. High Street, Queenborough.
1913		Ross, Hector. Sheriff of Tasmania. Elphinstone Road, Hobart.
1896		Scott, R. G., M.B., Ch.M. 172 Macquarie Street, Hobart.
1892	C	*Shirley, John, D.Sc. Inspector of Schools, Queensland. "Colarmie," Brunswick Street, New Farm, Brisbane.
1901		Shoobridge, Canon G. W. 3 Molle Street, Hobart.
1909		Simmons, M. W. A.M.P. Buildings, Elizabeth Street, Hobart.

Year of Election.		
1875		*Simson, Augustus. 49 High Street, Launceston
1901	C	Smith, R. Greig-, D.Sc. Linnean Hall, Elizabeth Bay, Sydney.
1915		Smith, S. C., B.A. Hutchins School, Hobart.
1913		Smithies, John. Lindisfarne.
1896	L	*Sprott, Gregory, M.D., C.M. 134 Macquarie Street, Hobart.
1896	L	Sticht, Robert, B.Sc., E.M. Mount Lyell Mining and Railway Co. Ltd., Queen Street, Melbourne.
1913		Susman, Maurice. 88 Murray Street, Hobart.
1907		Tarleton, J. W. 108 High Street, Queenborough.
1887		*Taylor, A. J. Librarian of the Tasmanian Public Library. 28 D Arcy Street, Hobart.
1892	C	*Thomson, G. M., F.L.S. Dunedin, New Zealand.
1896		*Twelvetrees, W. H., F.G.S. Government Geologist. Geological Survey, Launceston.
1901	C	Wall, Arnold, M.A. Professor of English Language and Literature in Canterbury College. Christchurch, New Zealand.
1913		Wardman, John. Superintendent of the Botanical Gardens. Botanical Gardens, Hobart.
1912		Waterhouse, L. L., B.E. Assistant Government Geologist. Geological Survey, Launceston.
1913		Waterworth, Newham. Lindisfarne.
1913		Wayn, Miss Lucy. "Fairfield," 246 Campbell Street, Hobart.
1912		*White, Arthur. St. Cross, Harleston, Norfolk, England.
1915		Williams, Evan, B.Sc. Friends' High School, Hobart.
1901		Wise, H. J. 4 Colville Street, Hobart.
1903		Wolfhagen, Waldemar. Augusta Road, New Town.
1897	C	Woodward, B. H., F.G.S. Director of the Western Australian Museum and Art Gallery. Perth, Western Australia.

Members are asked to inform the Secretary of any change of address or other necessary correction.

ANNUAL REPORT.

In accordance with Rule 39, the Council present a Report on the proceedings of the Society during the year 1915.

The Council and Officers.

At the Annual General Meeting, held on 22nd March, the following were elected members of the Council for the year:—Dr. A. H. Clarke, Messrs. L. H. Lindon, L. F. Giblin, L. Dechaineux, J. A. Johnson, L. Rodway, E. L. Piesse, Professor T. T. Flynn, and Dr. J. L. Glasson.

The Council at its first meeting elected Dr. Clarke to be its Chairman, and appointed Dr. Glasson to be Honorary Secretary, Mr. Rodway to be Honorary Treasurer, and Mr. Piesse to be Honorary Librarian.

The Council elected Drs. Clarke and Glasson, Professor Flynn, Messrs. Johnson, Dechaineux and Rodway, to be Trustees of the Tasmanian Museum and Botanical Gardens during the current year.

Owing to the absence of Mr. Piesse on military duty, it was found necessary to appoint an Assistant Librarian. Mr. Dechaineux was appointed to this office.

Ten ordinary meetings of the Council were called during the year 1915. The attendances of members were as follow:—Dr. Clarke, 8; Professor Flynn, 6; Mr. Giblin, 7; Mr. Johnson, 10; Mr. Piesse (on leave), 1; Mr. Rodway, 10; Dr. Glasson, 9; Mr. Lindon, 5; Mr. Dechaineux, 8.

Meetings of the Society.

Eight Monthly General Meetings of the Society were held in addition to the Annual Meeting. In May the meeting took the form of a Conversazione, at which exhibits of scientific apparatus and experiments, and short lectures on popular scientific subjects were given by members. Nine papers were read during the session, and several addresses were given by members and visitors.

Members.

During the year 4 new members were elected into the Society. We lost 32 members through death, resignation, or change of residence. The number of ordinary members at the end of the year was 106. There were also 8 members who have compounded their subscriptions for life, 4 honorary members, and 14 corresponding members.

Papers and Proceedings.

The Council has ordered 650 copies of the "Papers and Proceedings" for 1915. The Council is pleased to report that the Government, recognising the desirability of assisting the scientific workers in Tasmania, recommended to Parliament the appropriation of £100 in aid of the printing of the Society's "Papers and Proceedings." Parliament has approved of the appropriation of this amount for the State financial year, 1915-16, but unfortunately payment could not be made until 1916, so that the item could not be inserted in the Society's balance-sheet for 1915.

The Library.

During the year 700 books and pamphlets were received, making a total of 12,015 in the Library on 31st December, 1915, besides 1,267 maps, newspapers, manuscripts, etc. The presentations during the year were of a published value of about £250. The following presentations are of particular value and importance:—

Expédition Antarctique Francaise (1903-5), 18 vols.

Deuxième Expédition Antarctique Francaise (1908-10), 21 vols.

Transactions of the Linnean Society of London, 25 vols.

Scientific Results of the Scotia, 5 vols.

Owing to the serious congestion of the Library, the Council has this year had the end wall of the Library shelved. The additional shelving thus provided should suffice for several years.

SUPPLEMENTARY LIST* OF INSTITUTIONS, ETC., TO WHICH THE PUBLICATIONS OF THE SOCIETY ARE PRESENTED.

United States of America.

Florida State Geological Survey, Tallahassee.

National Academy of Sciences, Washington.

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*This list supplements the list printed in the "Papers and Proceedings" for 1913, pp. 320-324, and 1914, pp. 105-108.

RECEIPTS AND EXPENDITURE, 1915. GENERAL ACCOUNT.

RECEIPTS.

1914.	£	s.	d.
Balance from 1914	4	8	9
Subscriptions—106 at £1 1/0	111	6	6
Arrears and Donations	6	1	4
Payments for use of Society's Room	1	1	0
Interest on Savings Bank Account	0	2	6
	£122	19	7

EXPENDITURE.

1915.		£	s.	d.
Attendant—				
Salary	£6 0 0			
Extra attendance	4 15 0			
		10	15	0
Papers and Proceedings—				
1914—Printing	20 15 4			
Distribution	4 3 1			
1915—Printing	37 7 9			
		62	6	2
Library—				
Books and Magazines	6 8 1			
Binding	4 1 0			
Insurance	4 16 9			
Shelving	6 15 0			
Sundries	0 2 3			
		22	3	1
Expenses of Meetings—				
Notices and Advertising	8 9 2			
Fuel and Light	1 18 6			
		10	7	8
Miscellaneous—				
Auditor	1 1 0			
Stamps	7 0 4			
Stationery	4 10 0			
Bank Charges and Cheque Book	0 15 0			
Sundries	2 8 6			
		15	14	10
Balance to 1916		1	12	10
		£122	19	7

MORTON ALLPORT MEMORIAL FUND ACCOUNT.*

1915.	£ s. d.	1915.	£ s. d.
Balance from 1914	0 19 3	Balance to 1916	10 14 3
Interest received from Perpetual Trustees Co.	9 15 0		
	£10 14 3		£10 14 3

* £200 was raised by public subscription in 1878 to establish a Memorial of the late Morton Allport. The Fund is invested in the name of the Perpetual Trustees, Executors and Agency Co. of Tasmania Ltd., and the income is used for the purchase of books for the Library of the Society.

I have this day examined the Books and Vouchers of the Royal Society of Tasmania for the year 1915, and found them correct and in accordance with these Accounts.

H. W. W. ECHLIN,
Auditor.

January, 1916.

L. RODWAY,
Honorary Treasurer.

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FOR THE YEAR
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1879	0	10	0	7	1912	0	8	0	6
1880	0	5	0	3	1913	0	15	0	11
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*Out of print.

A detailed list of the "Papers and Proceedings," and of miscellaneous publications of the Society, was issued with the "Papers and Proceedings" for 1913. Copies can be had on application to the Secretary.

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